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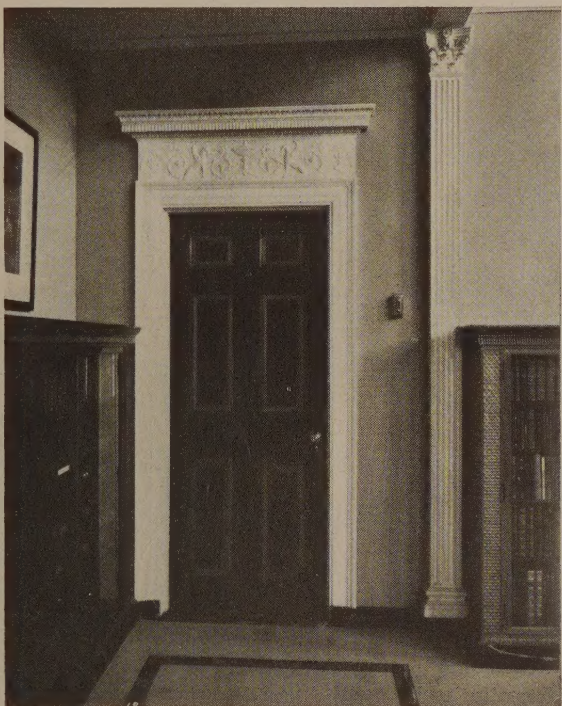
Stetson Hall—The Williams College Library

Cram & Ferguson, Architects

AS is almost invariably the case, the plan for Stetson Hall, the Williams College Library, was determined in a large measure by the orientation of the site and its contours. The lot drops some twenty-five feet from front to back, and falls away about eight feet to the north. While this makes difficulty in designing, it afforded a splendid opportunity to get a very high and compact stack-room, and splendid workrooms in the basement. Thus the requirements throw light on the solution.



Chapin Room doorway.

The housing of one of the most extraordinary collections of Americana and other very rare English literary works in the United States (known as the Chapin Library, given by Alfred C. Chapin) was of almost equal importance to the usual college library problem. While these two problems were so nearly balanced in importance, the space required for the Chapin collection was appreciably smaller than that required for necessary reading, delivery, stack, museum, seminar, and study rooms.

The expression of the twofold importance of the building was effected architecturally by the two entrances and the two fronts. The south front is the Chapin front, while the long front, the west front, is the college library entrance.

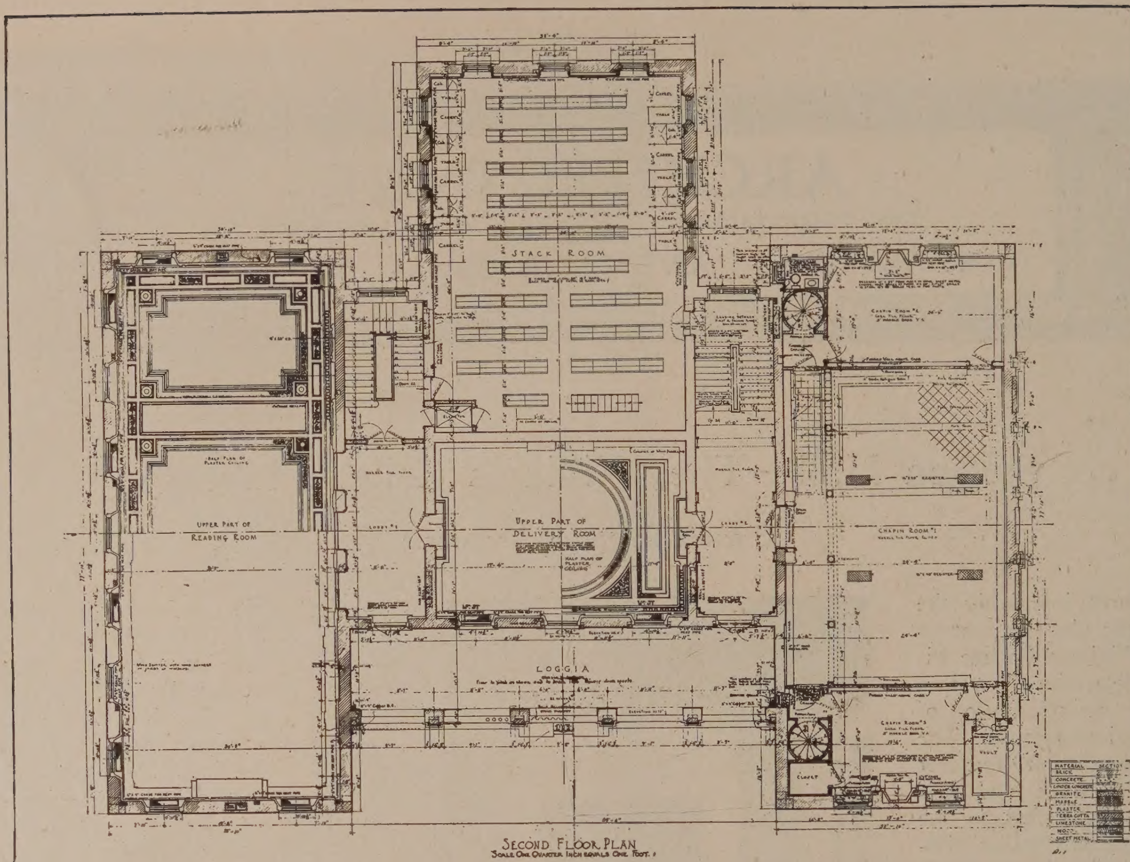
The importance given the corridors and grand staircase leading to the Chapin rooms has further added to its importance.

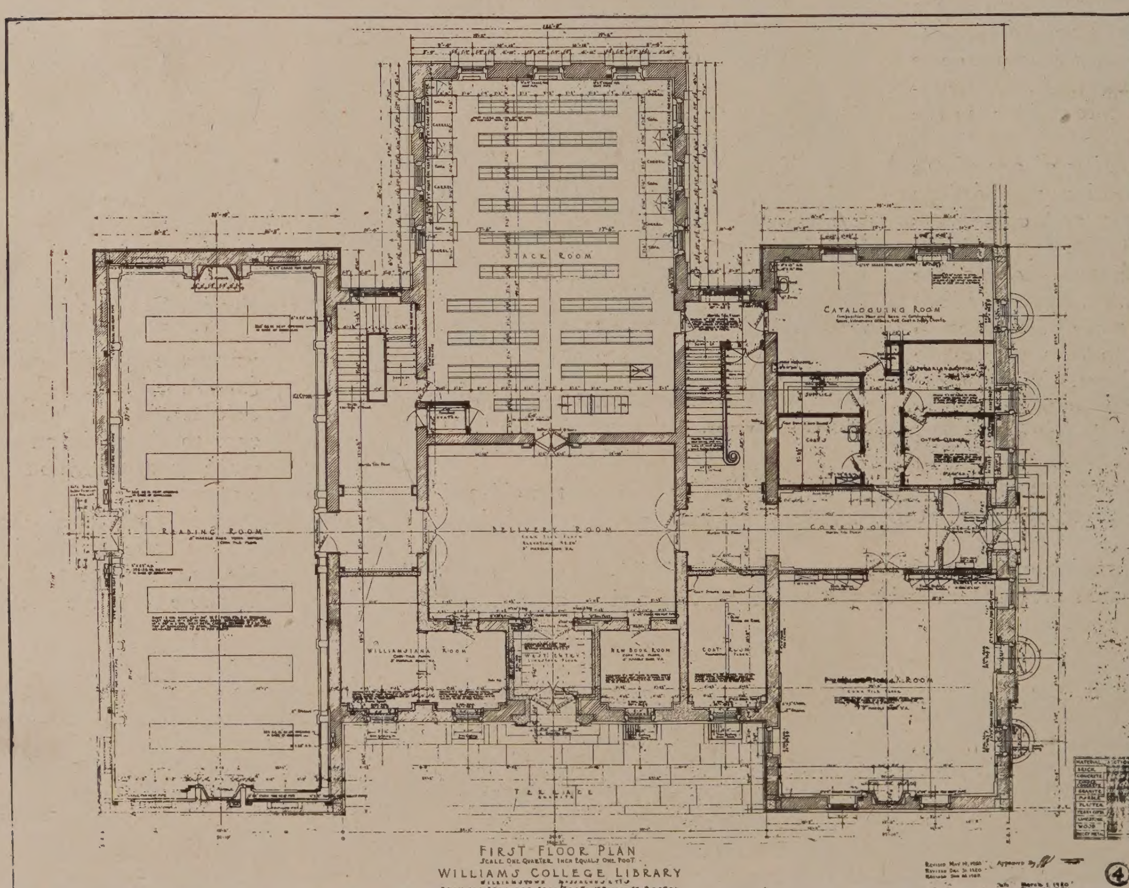
Every effort was made to have the college library function properly, and the disposition of the main elements, the stack and work rooms, delivery room and reading rooms, relates according to the modern library idea of efficiency.

Classic architecture presented itself as the reasonable style. The old Colonial work in Williamstown is very excellent, and the predominating modern work has been quite faithfully English Georgian in spirit.

In Stetson Hall an effort was made to design quite freely from American and English precedents without slavish adherence to either, in an effort to make it a transition between the old and new work on the campus.

This principle was followed in both interior and exterior design. The Chapin rooms were treated in white and color, while the inevitable constant use to which the other departments of the building were to receive dictated oak.


STACK ROOM
UPPER PART OF READING ROOM
UPPER PART OF DELIVERY ROOM
LOGGIA
CHAPIN ROOM
SECOND FLOOR PLAN
SCALE ONE QUARTER INCH EQUALS ONE FOOT


STACK ROOM
CATALOGUING ROOM
READING ROOM
DELIVERY ROOM
CORRIDOR
WILLIAMSIANA ROOM
NEW BOOK ROOM
COAT ROOM
TERRACE
FIRST FLOOR PLAN
SCALE ONE QUARTER INCH EQUALS ONE FOOT
WILLIAMS COLLEGE LIBRARY
CRAM AND FERGUSON ARCHITECTS BOSTON

WILLIAMS COLLEGE LIBRARY, WILLIAMSTOWN, MASS.

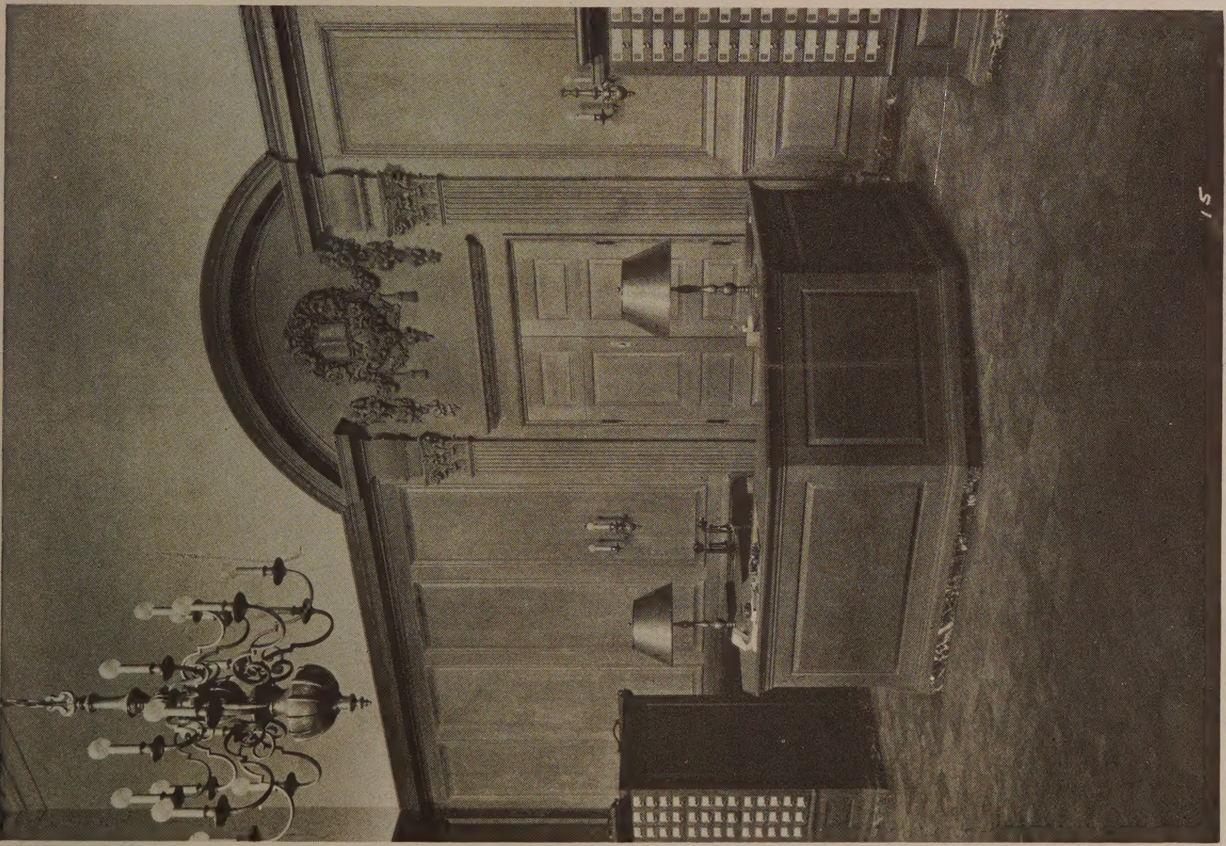
Cram & Ferguson, Architects.

General view from southeast, showing the steep grade upon which the building was built. The college chapel is seen in the foreground.

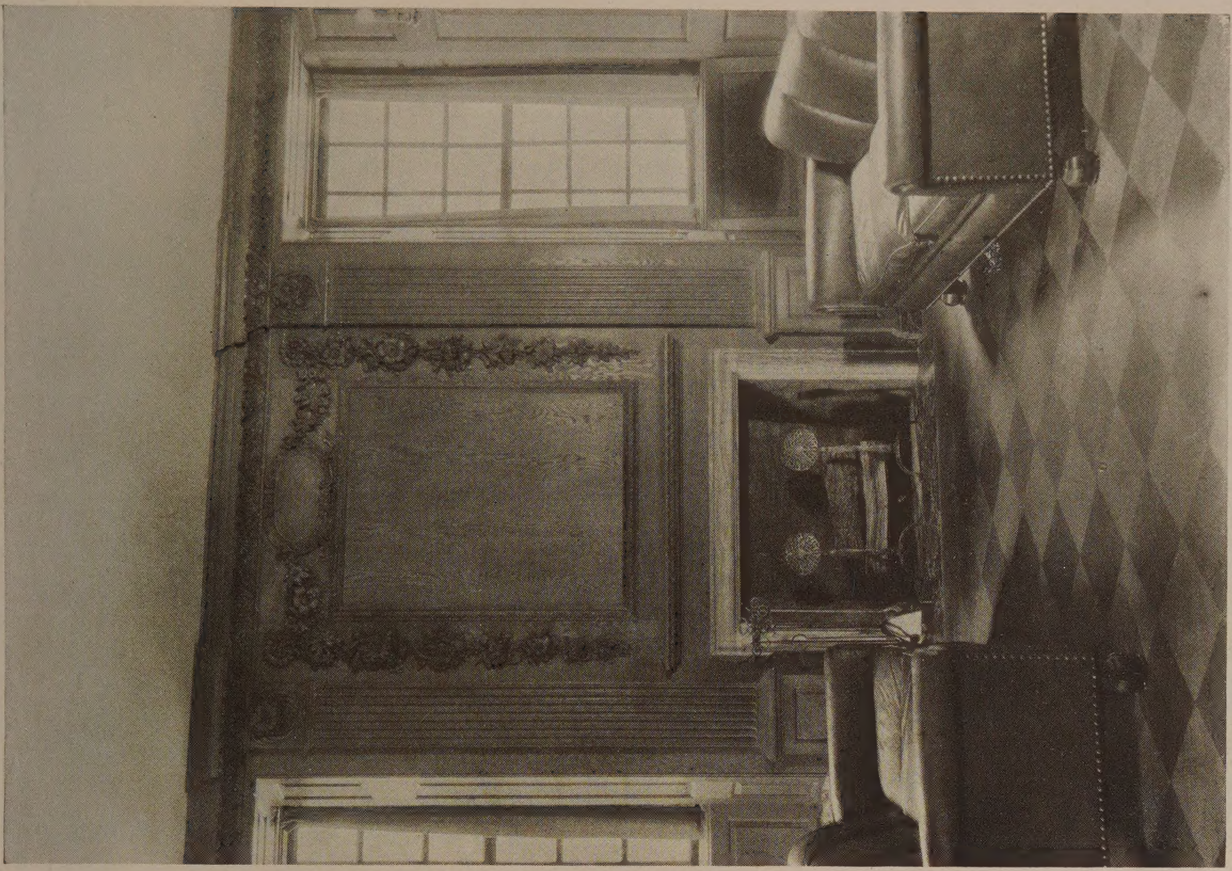
The main room in which the Chapin collection is housed.

Under the gallery in the main Chapin room the bookcases are bronze and the small columns cast in iron.

WILLIAMS COLLEGE LIBRARY, WILLIAMSTOWN, MASS.
Cram & Ferguson, Architects.



Delivery room, showing main entrance to stacks.



Fireplace detail in Hamilton Wright Mabie room (periodical room).

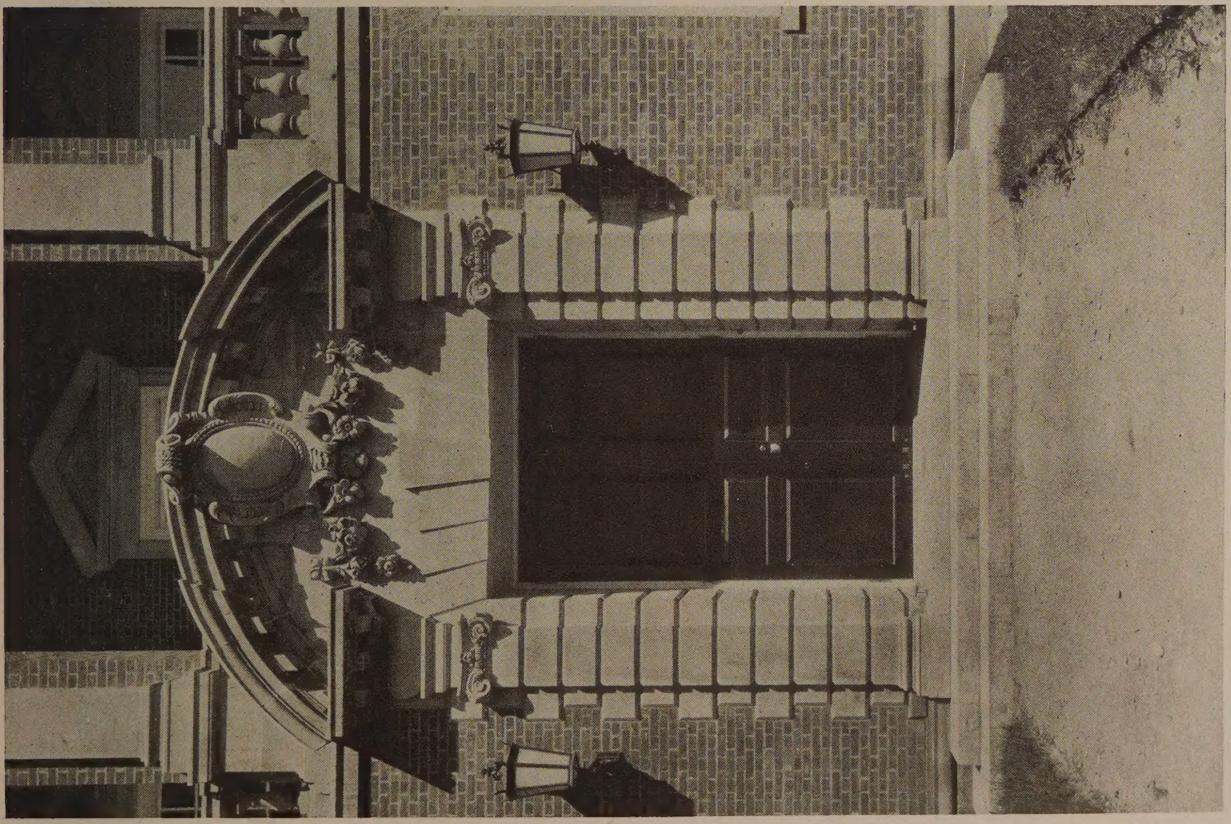
WILLIAMS COLLEGE LIBRARY, WILLIAMSTOWN, MASS.

Cram & Ferguson, Architects.

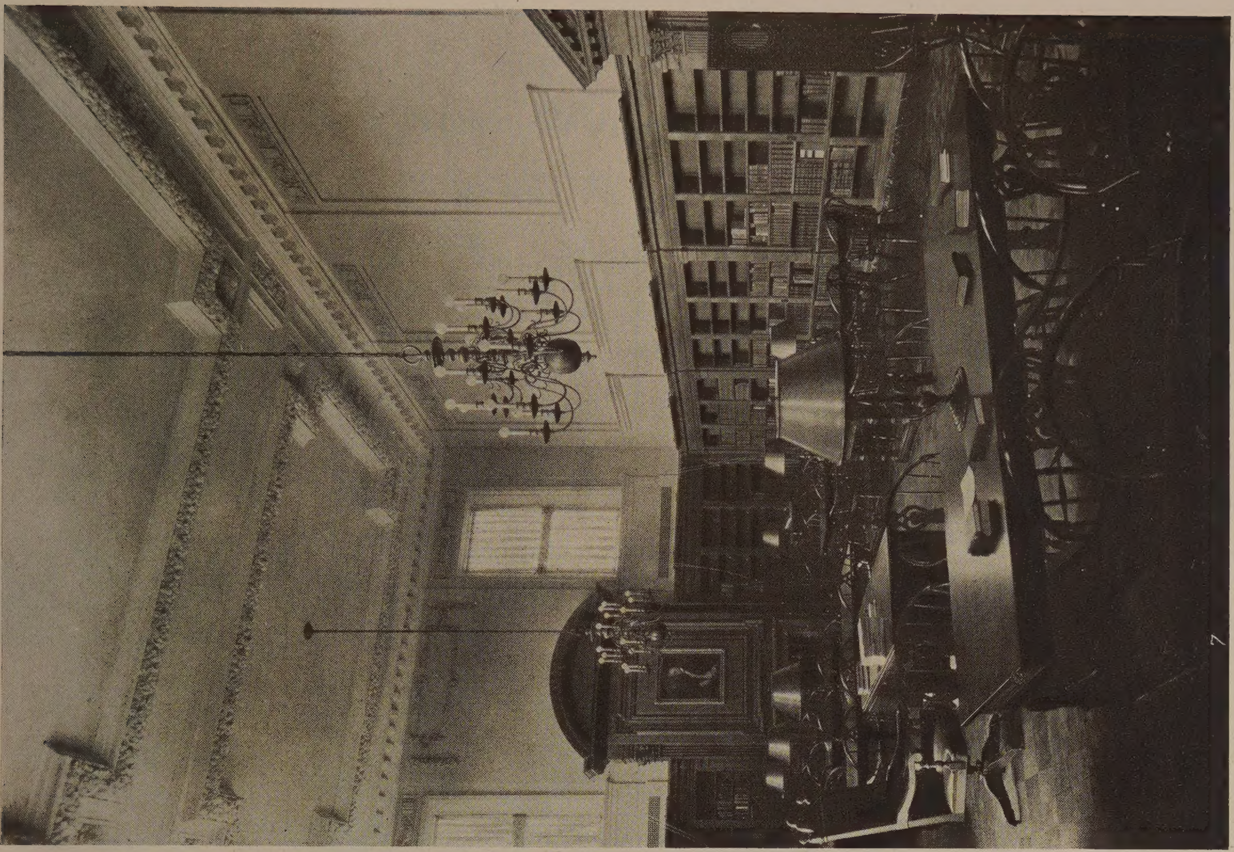
Stone balcony on north side. This balcony is on the long axis of the building, and leads to the reading-room directly opposite its main entrance.

On the loggia looking south.

WILLIAMS COLLEGE LIBRARY, WILLIAMSTOWN, MASS.
Cram & Ferguson, Architects.



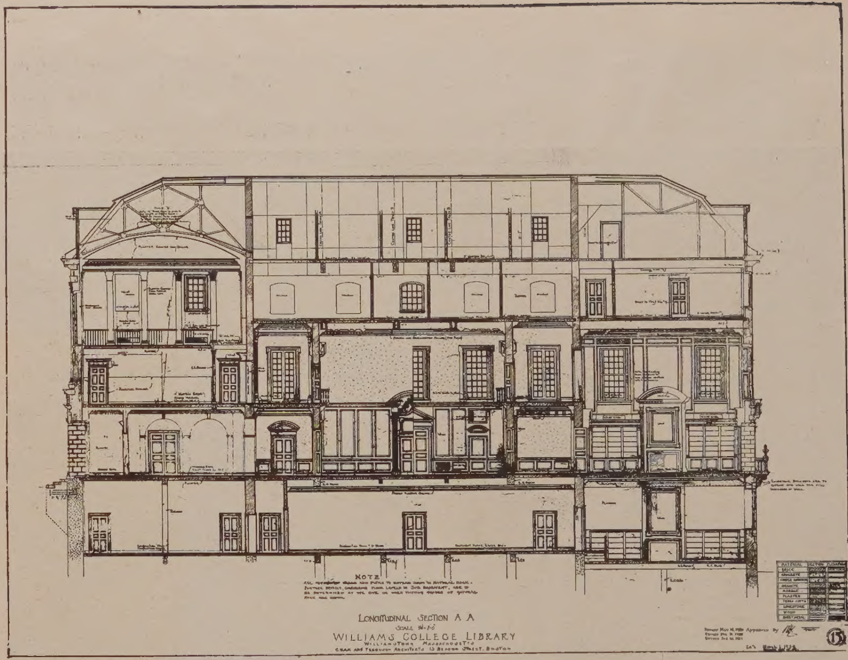
West entrance detail.

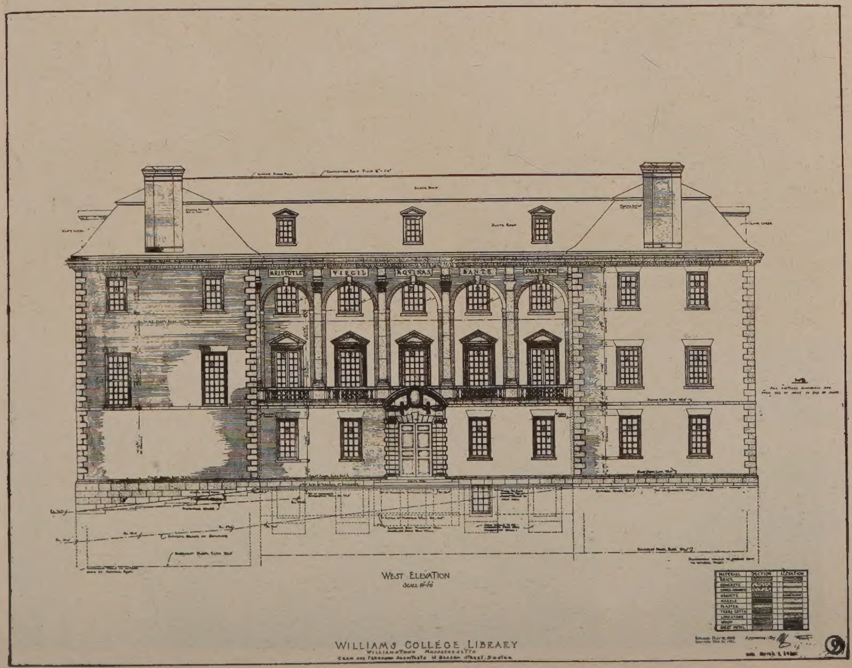


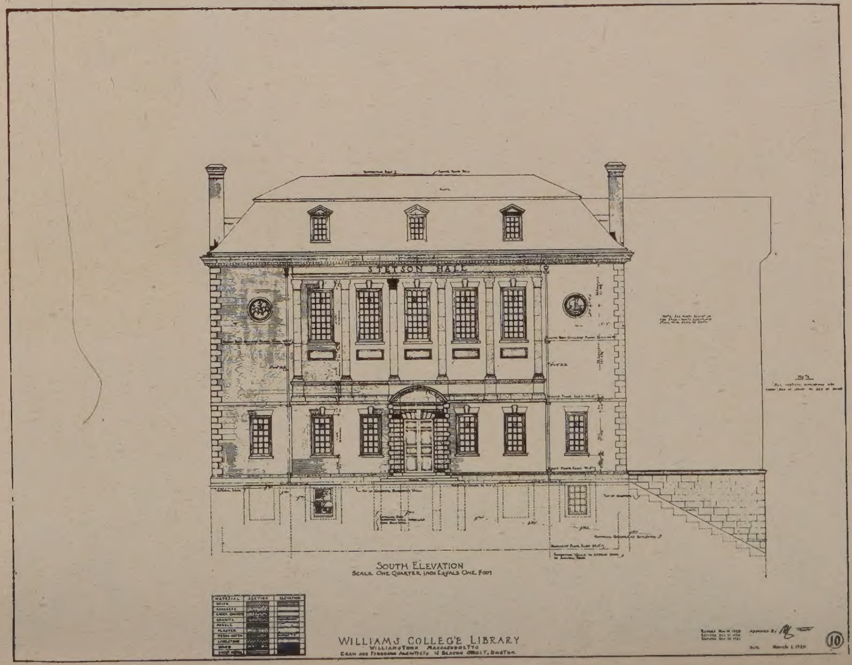
The main reading-room. There is a reserve room of the same size on the basement floor.

WILLIAMS COLLEGE LIBRARY, WILLIAMSTOWN, MASS.
Cram & Ferguson, Architects.

GENERAL VIEW FROM THE SOUTHWEST.







Cram & Ferguson, Architects.

The Great North Window, Chapel of United States Military Academy, West Point, New York

On June 10, in the United States Military Chapel, at West Point, in the presence of officers of the army, who had gathered from coast to coast, there was dedicated the Great North Window.

The motto under the window reads:

TO OUR GRADUATES WHO DIED IN THE WORLD WAR—PROUDLY THEIR ALMA MATER CLAIMS THEM AS HER OWN. MAY SHE HAVE SONS LIKE THESE FROM AGE TO AGE

Reaching from the top of the portal to the apex of the roof, and divided into twenty-eight lancets, each eight feet high, the window fills the façade with the radiance of a glorious vision in glass.

The subject is the Apocalypse. Each lancet is divided into two or more subjects, so that, while the first impression of this Beatific Vision in glass is The Great Glory and The Light Ineffable, as one continues to look and study many subordinate visions are revealed. The true thirteenth-century feeling is evinced by the fact that while each incident is separate and distinct, no one part transcends the other, and it remains a translucent section of the wall, a magnificent decoration, made up of myriads of jewel-like segments of color, restrained and decorative, yet vibrant from the juxtaposition of one line to another.

The structural divisions and treatment are identical with those of the sanctuary window opposite, but the color scheme for a north window is naturally lighter, and may be said to take its key from "the rainbow round about the throne," on which is seated the figure of Christ Enthroned, and which extends through the myriad lancets, reflected in the bright-hued wings of the angels in the side lancets. The window is executed in segments of jewelled color (as many as 400 pieces to a foot), of choicest imported glasses, many of which, now rare, were collected with great care from various parts of Europe; and is etched in the mediæval manner, as exemplified by Albert Dürer and the ancient glass artists, whose work has withstood the ravages of time longer than any other form of colored art. It is a flat and formalistic section of decorated wall, without, however, any attempt at copying the defects of drawing which belonged to the infancy of the art. As in the windows of the old mediæval cathedrals, much of the fine detail of color in the higher lancets can be more effectively brought out by the use of a field-glass; for the chapel is in reality a cathedral, a replica of Durham.


The Apocalypse Window.

This stupendous design was started by William Willet some ten years prior to his untimely death, and had been developed with the hope that it might some day be placed in this north window, which its committee had reserved to mark some great event, as he felt it would complete the color scheme as well as the thought of the Passion window in the sanctuary opposite, already made by him and his wife in collaboration, as were the other windows of the chapel.

The World War provided the incident, and, though many designs were submitted to the academy by artists of this country and England, this design as completed by Mrs. Willet, was premiated and executed by her in collaboration with her son.

This is a memorial of national importance erected by the National Association of Graduates with funds raised in four months from all over the United States.

THE GREAT NORTH WINDOW, CHAPEL, WEST POINT, NEW YORK.

The subject is Christ Enthroned, in his triple character of Prophet, Priest, and King, the Alpha and Omega in the midst of the Seven Golden Candlesticks.

In the lancet beneath is shown "the Woman who escaped to the wilderness with the Man-Child." Surrounded by the four and twenty Elders, she symbolizes the Church of history. At the foot is the Seer, St. John himself. He sits in the midst of the Tree of Life, whose branches, carried through the side panels, "are for the healing of the nations."

Editorial and Other Comment

College Architecture

TRADITION holds sway in most of our new college architecture, and it is fortunate for the public and the student body that so good a tradition as Gothic is so generally dominant. More than half the charm and appeal of Oxford and Cambridge lie in the individuality and appropriateness of the use of Gothic. To be sure, these ancient institutions were founded by the church; they smacked of the gown, of the priest, and the ritual of the church, and Gothic was the natural inheritance of such influences. Our modern colleges cannot be said to be any longer governed, with few exceptions, by any purely religious influences. They are secular in a broad sense, and in some of them the old institution of compulsory chapel attendance has become obsolete. But this has nothing to do with architecture. If we are still using the so-called collegiate Gothic, it is because nothing better has been invented to convey the atmosphere of seclusion and scholarly retirement.

We had the honor of publishing, several years ago, the beautiful and dignified buildings at Princeton known as Holder and the Halls, by Day & Klauder, and this same firm are the designers of Pyne Hall, shown in this number. Surely Princeton of all our universities has been blessed in its location and advisers, and the feeling of unity that one gets from an inspection of the college buildings there is a rare asset.

View through west archway across court-yard, Pyne Hall, Princeton University. Day & Klauder, Architects.

The new dormitory is in harmonious keeping with other recent buildings, and adds its own element of distinction and diversity to a very notable group.

At Princeton they are carrying out a building programme that promises to make the university more than ever worthy of an architectural pilgrimage.

Our readers will remember also that we published the beautiful Harkness Memorial, designed by James Gamble Rogers, also collegiate Gothic, with many fascinating and diverting variations from type. What a pity that this fine group had to be placed in the environment of a city residential district of the old sort.

In spite of this it is Yale's most distinguished college building, and once you pass the gate that looks out on the green you forget all but the pervasive charm of the place itself.

Our new college architecture all over the country is worthy of praise and careful study, and out on the far Pacific coast they are doing things that are preserving the beautiful old Spanish traditions, and giving us an architecture of remarkable charm and climatic fitness.

In the designing of Stetson Hall, the new library at Williams College, Cram & Ferguson had before them the Colonial traditions, and they have adhered to the type in general, but with modifications that preserve a beautiful harmony and at the same time indicate a period of transition.

Certainly we may be proud of our collegiate architecture when in the hands of such accomplished leaders in the profession.

Signed Architecture

THE thing that might cause occasional embarrassment to some architects who cared to sign their work would be a retrospective look, now and then, at some of the things they have designed in the past. We know of a famous American painter who looks with horror, now that his reputation is firmly established on the basis of a fat bank account, upon some of the little pot-boilers of his youth and days of struggle. No doubt in the beginning he thought his work something beyond the ordinary, and as a matter of fact it was, and some of his collector friends take pride in possessing one of his early examples, and even say that they are just as good as his later works.

But architecture is different; you cannot hide the faults

of a badly designed and badly planned building, and if you are the guilty architect you cannot ever forget it, unless the march of modern progress brings you luck, and the old is torn down to give way to the new.

There are many compromises in designing a building, and among them are those compelled by the owner's ideas of economy, not to speak of the owner's ideas of "what he likes."

How many buildings, we wonder, that adorn our cities or, too often, disfigure them, alas, would the architects like to place their names upon?

We have, at times, advocated the signing of buildings just as the painters sign their pictures, so one might pick the sheep from the goats as we go about our way over the country.

There are not very many buildings that stand apart from all their neighbors as expressive of good and appropriate design, and most of these are known, at least to those interested at all in architecture. And yet where draw the line, and who in his wisdom may say with authority and conviction that this is altogether bad or that mostly good?

If you like Gothic, you can see little virtue in Italian Renaissance, and the Lord help you, if you fall for Queen Anne you will surely scorn the simplicity of the Colonial.

Art is a varied mistress, and who may tell us when she is a mere jade or a pedigreed palfrey?

The Theory of Architecture

THERE are many theories about art, and most of them in the last analysis spell only confusion of ideas and vexation of spirit. Art is not definable in terms that can be universally understood, and in much of the stuff that has been called art in recent years we can see only pretense and abrogation of the foundations upon which all decent art has developed.

Now and then light is thrown upon the subject by some clear-thinking analyist, who brings to his discussion of theories a practical vision of essentials. Most abstract discussion of the arts is tiresome, and when it comes to the thing dubbed "a philosophy of art," it is often more than tiresome, it becomes a source of irritation and a futile waste of precious moments. Of course there are minds that revel in hair-splitting definitions, in pure abstractions that are but inchoate ideas, that never really get anywhere.

We have been prompted to this by the receipt of a copy of Lionel B. Budden's essay on "An Introduction to the Theory of Architecture," that received the medal of the Royal Institute of British Architects, and which was published in the *Journal of the Royal Institute of British Architects*.

The author has a lot to say about the arts in general worth consideration, but we shall confine ourselves to the following excerpt on the art of architecture:

"The whole business of architecture as an art is not merely the 'expression of plastic ideas.' Architecture has also to serve as the vehicle of intuitions that embody much more besides. It must express qualities of character, of social and traditional significance. It cannot reasonably be dissociated from concern with everything but solid pattern. The effort to regard it in that light is as sterile as it is unnatural. If such an effort were made by architects it could result only in their leading architecture into a cul-de-sac. There is no force in the objection that the expression of character and of social and traditional qualities is so much story-telling and falls therefore within the scope of literature but outside that of architecture. In this respect architecture does not poach on the preserve of letters and do badly and in a secondary and irrelevant capacity what literature does well as its primary function. Architecture takes a portion of the subject-matter common to all the arts and presents it in a specific way. Character and social and traditional significance are not adventitious and extrinsic to the content of architecture: they are of its very essence: and architecture gives to them an expression peculiar to itself—an expression that no other art could give. So also painting, music and sculpture embody and re-present in a manner that is uniquely their own the elements of their subject-matters, whatever those elements may be, whether shared by literature or by any other art. It is precisely that difference in the mode and conditions of embodiment and re-presentation—rather than any ultimate difference in content—that distinguishes the arts from each other. A picture, a building, or a sonata can never pretend to tell a story in the way a novel can; but that is not to say that painters, architects, and musicians must not include in the material of their art matter that would inevitably receive another and very different treatment in literature; or that, if they do include such material, it is to be regarded at the best as of secondary importance and at the worst as a blemish or excrescence."

For Better Advertising

Prize-Winners in Architecture's Contest

OUR business department recently offered a series of prizes for the best criticisms of the manufacturers' announcements in our advertising pages. There were many responses, and the winners are announced as follows:

First Prize.—$50 in cash. To N. G. Walker, Rock Hill, S. C.

Second Prize.—$25 in cash. To Walter T. Steilberg, San Francisco, Calif.

Third Prize.—$15 worth of architectural books published by Charles Scribner's Sons. To William Foster Gordon, Paterson, N. J.

Fourth Prize.—$10 worth of books. To Samuel Lapham, Jr., Charleston, S. C.

Honorable Mentions were given to Louis Lott, of Dayton, Ohio, and Clark M. Will, Hubbard, Ore.

The New York Society of Architects Has Its Annual Play Day.—The annual summer outing of this society took place in June. A large representation of members and their friends numbering about 75 proceeded on the *De Witt Clinton* steamer to Interstate Park at Bear Mountain, on the Hudson. Two new amendments to the by-laws were adopted; one of which increased the membership fee to $10 for resident members, $6 for non-resident members, and $5 for junior members. The other amendment fixed a quorum of 12 members at any meeting of the society, and 5 directors at any meeting of the directors. Both of these amendments were unanimously adopted.

The American Hospital Association Committee on Floors is this year continuing its study on the subject of floors, and solicits samples for testing, these tests to be made the basis of a further report to the annual meeting of the association. Particulars may be obtained by writing the chairman, Frank E. Chapman, 1800 East 105th Street, Cleveland, Ohio. The committee consists of Doctor Thomas Howell, New York Hospital, New York City; Doctor Charles E. Young, Hospital of the Good Shepherd, Syracuse, New York; Mr. Charles F. Owsley, architect, Cleveland–Youngstown, Ohio; Mr. J. W. McBurney, Engineer of Tests, Board of Education, Cleveland, Ohio, and the chairman.

PYNE HALL, PRINCETON UNIVERSITY, PRINCETON, N. J. With sketch by Mr. Klauder.

Day & Klauder, Architects.

NORTHWEST WING.

NORTHWEST CORNER IN COURTYARD.

Day & Klauder, Architects.

PYNE HALL, PRINCETON UNIVERSITY, PRINCETON, N. J.

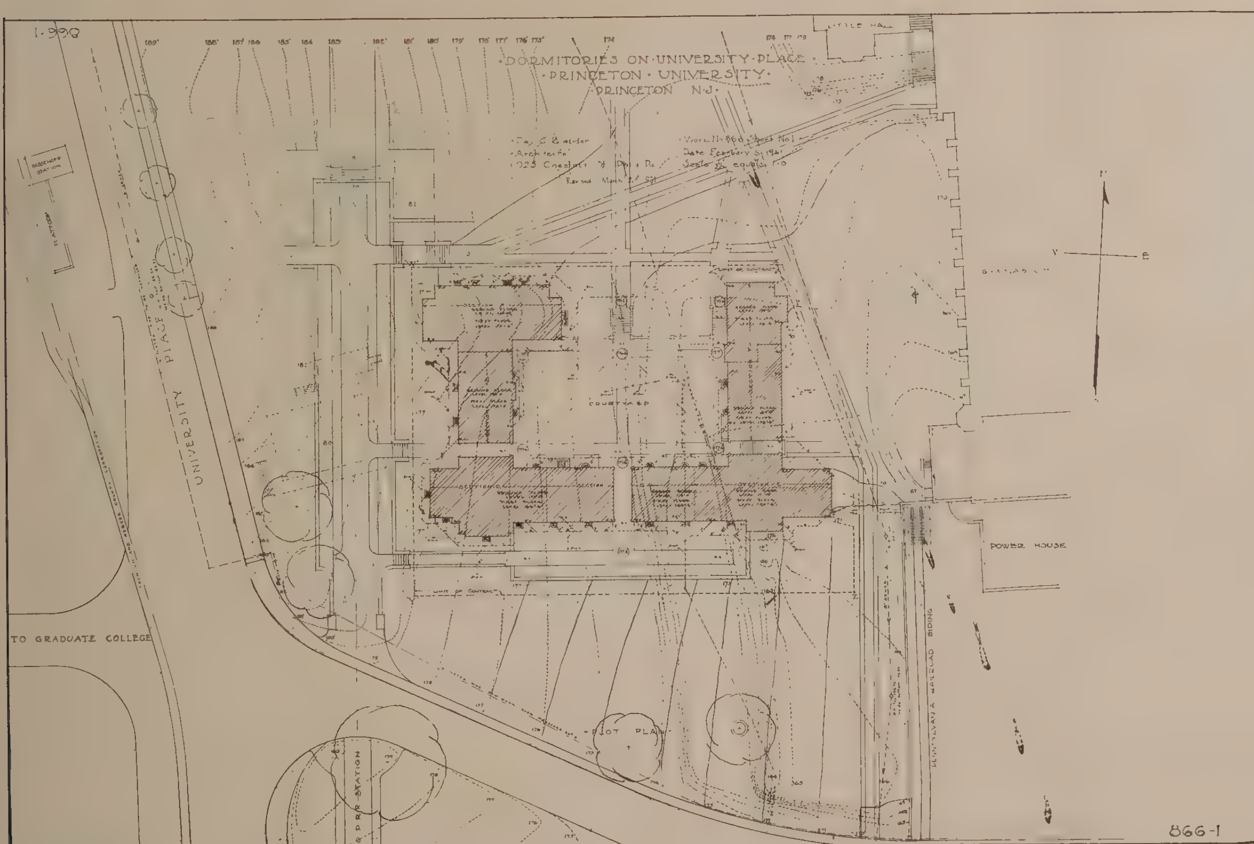
DETAIL AND ARCHWAY ENTRANCE TO COURTYARD, WEST SIDE.

SOUTHWEST CORNER IN COURTYARD.

PYNE HALL, PRINCETON UNIVERSITY, PRINCETON, N. J.

Day & Klauder, Architects.

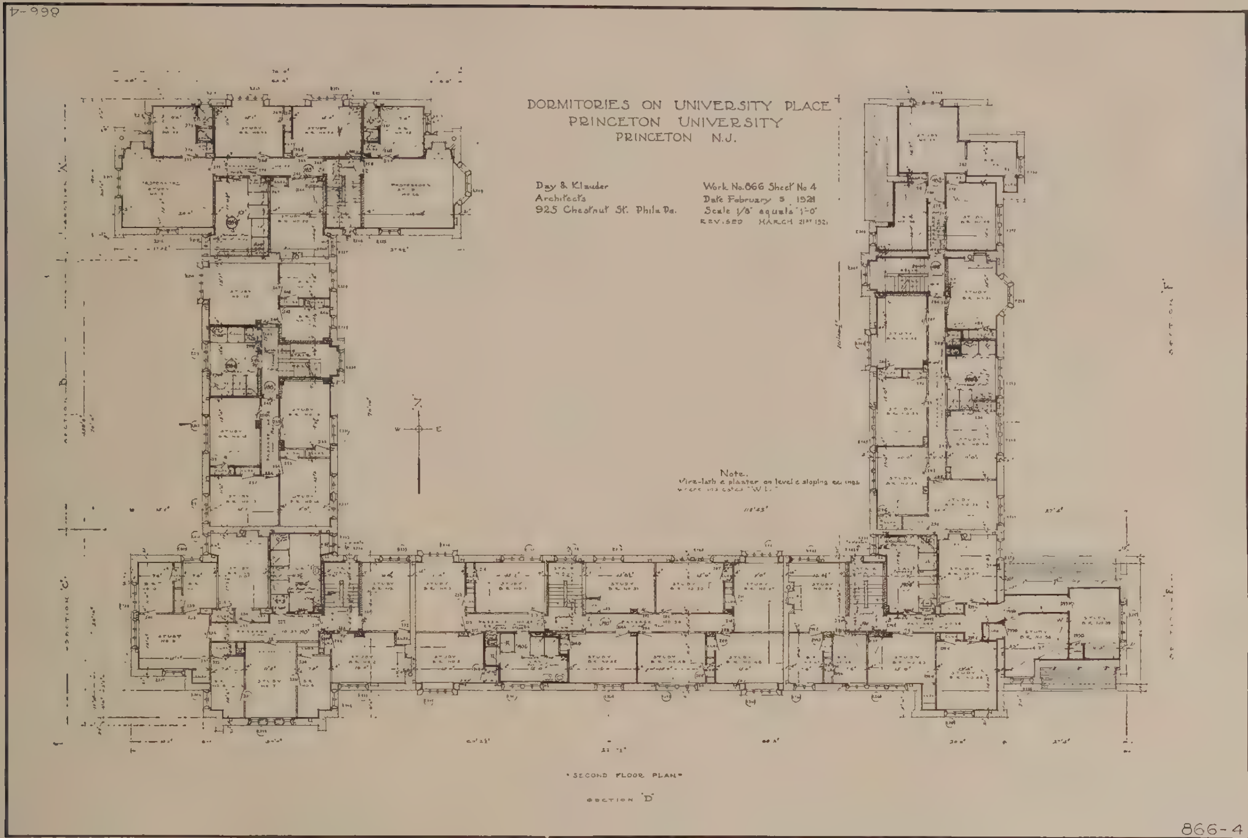
COURTYARD SHOWING EAST WING.

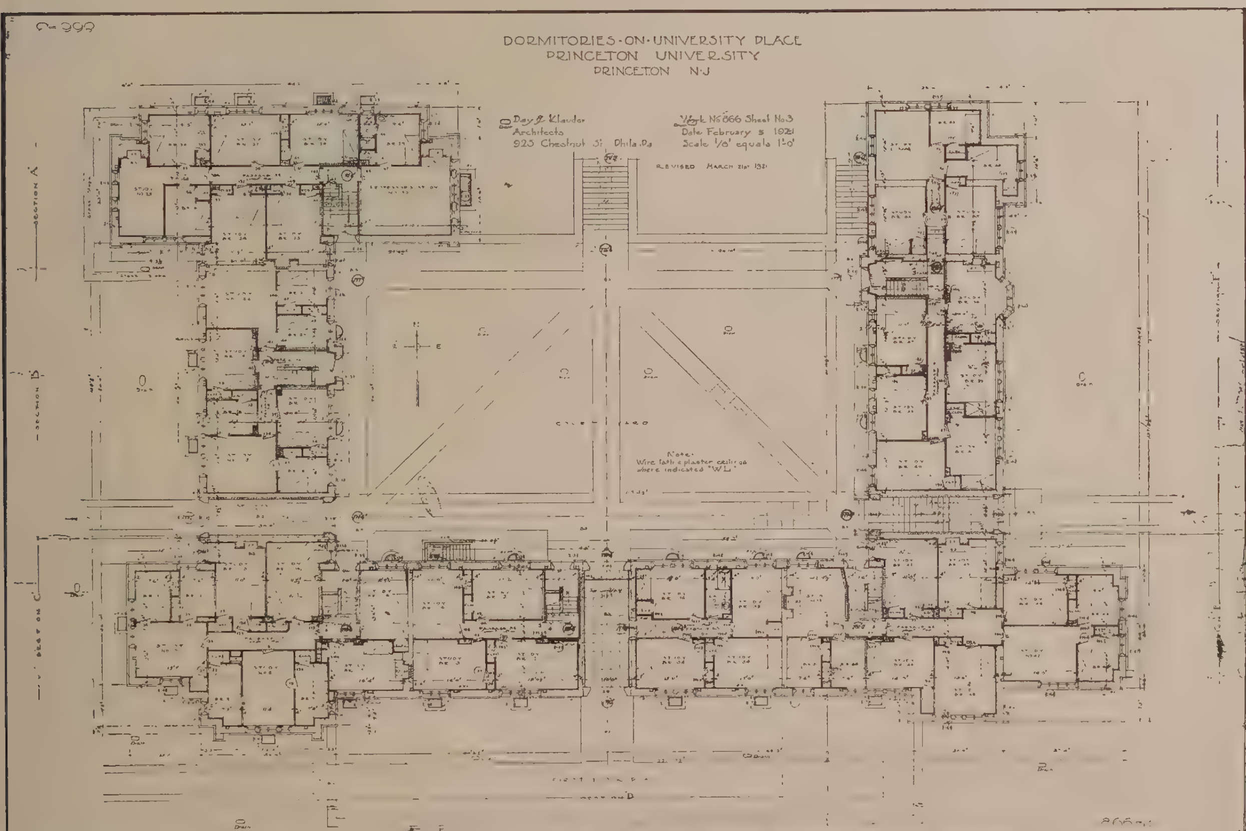


GROUND PLAN.

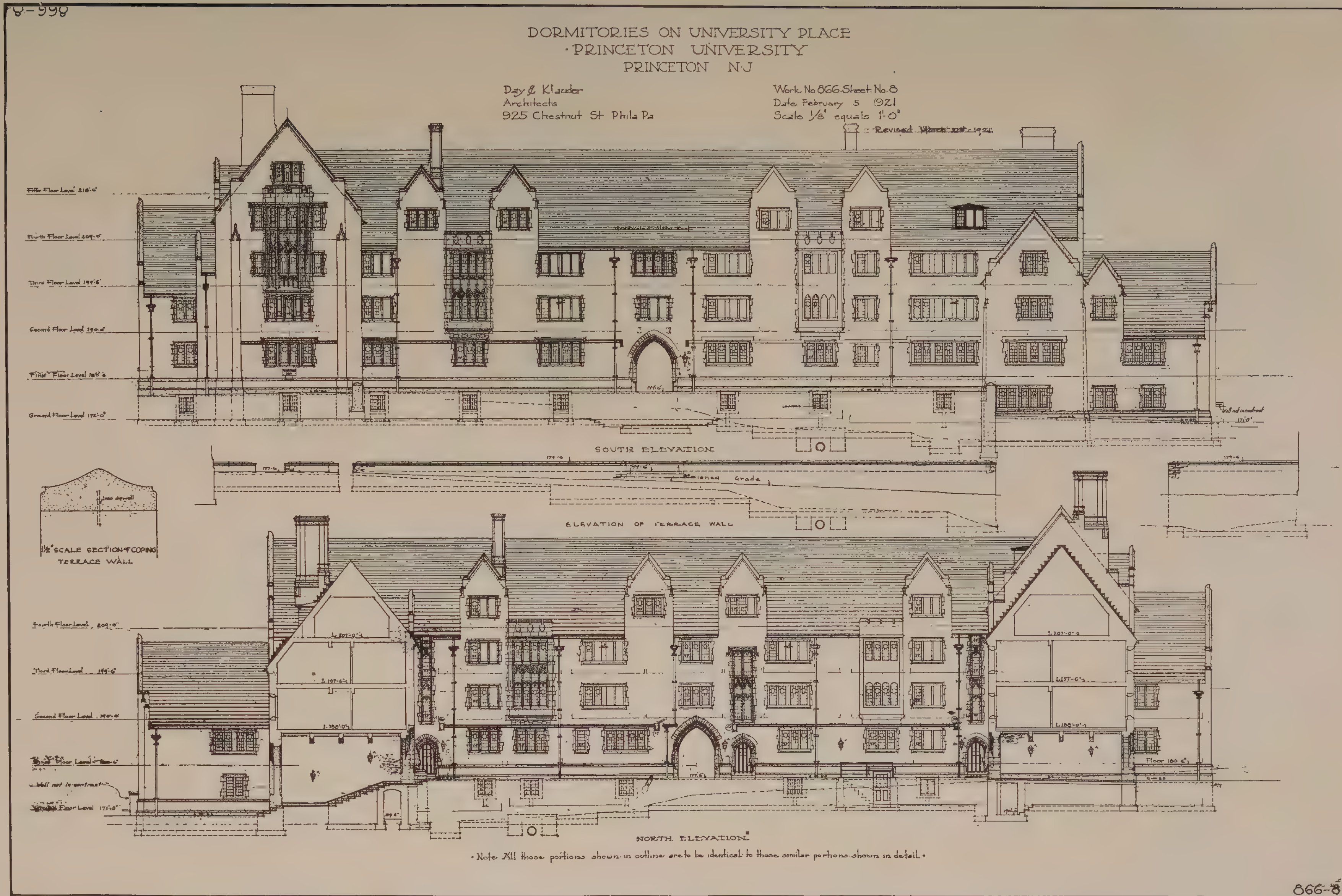
Day & Klauder, Architects.

PYNE HALL, PRINCETON UNIVERSITY, PRINCETON, N. J.



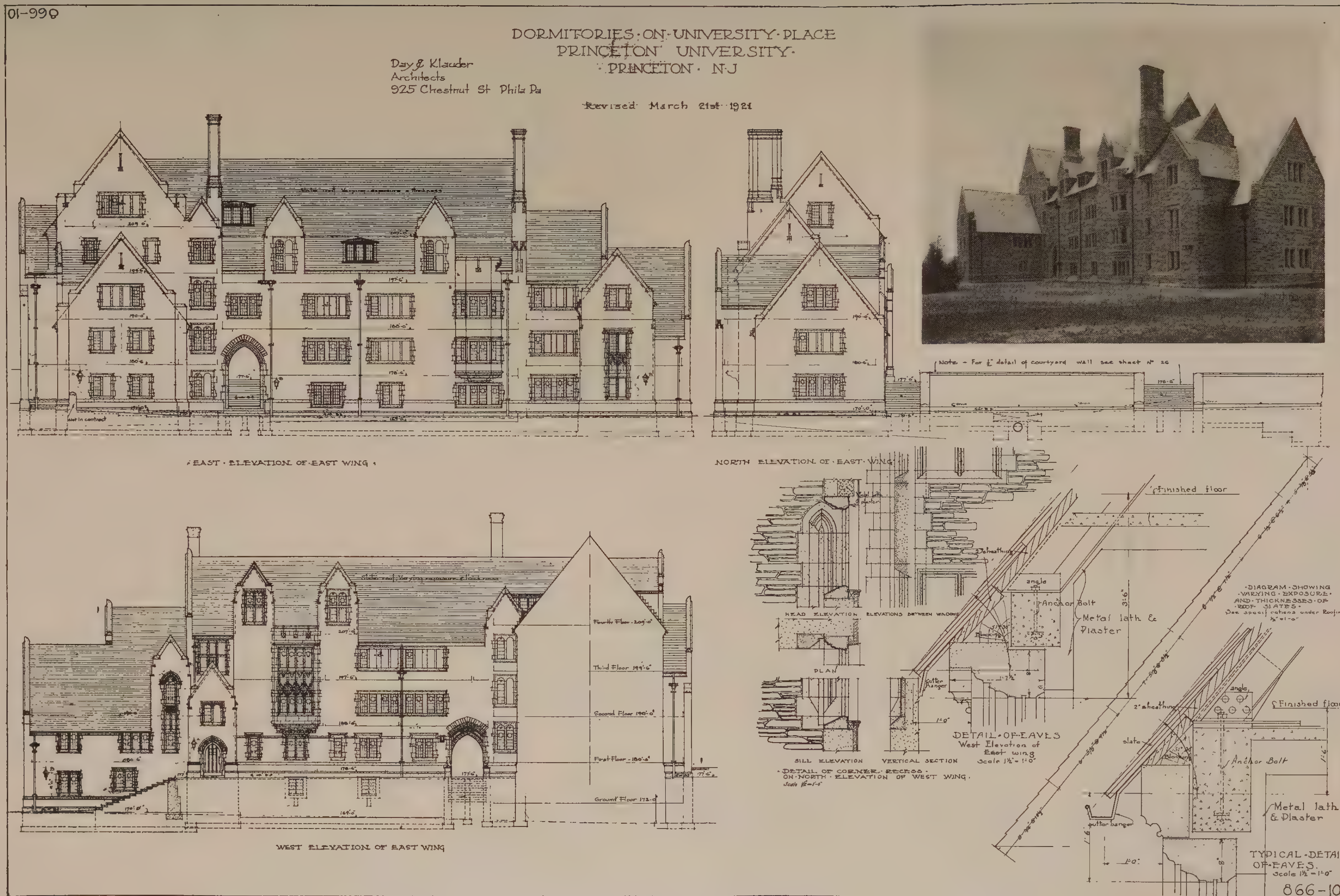


PLANS, PYNE HALL, PRINCETON UNIVERSITY, PRINCETON, N. J. Day & Klauder, Architects.



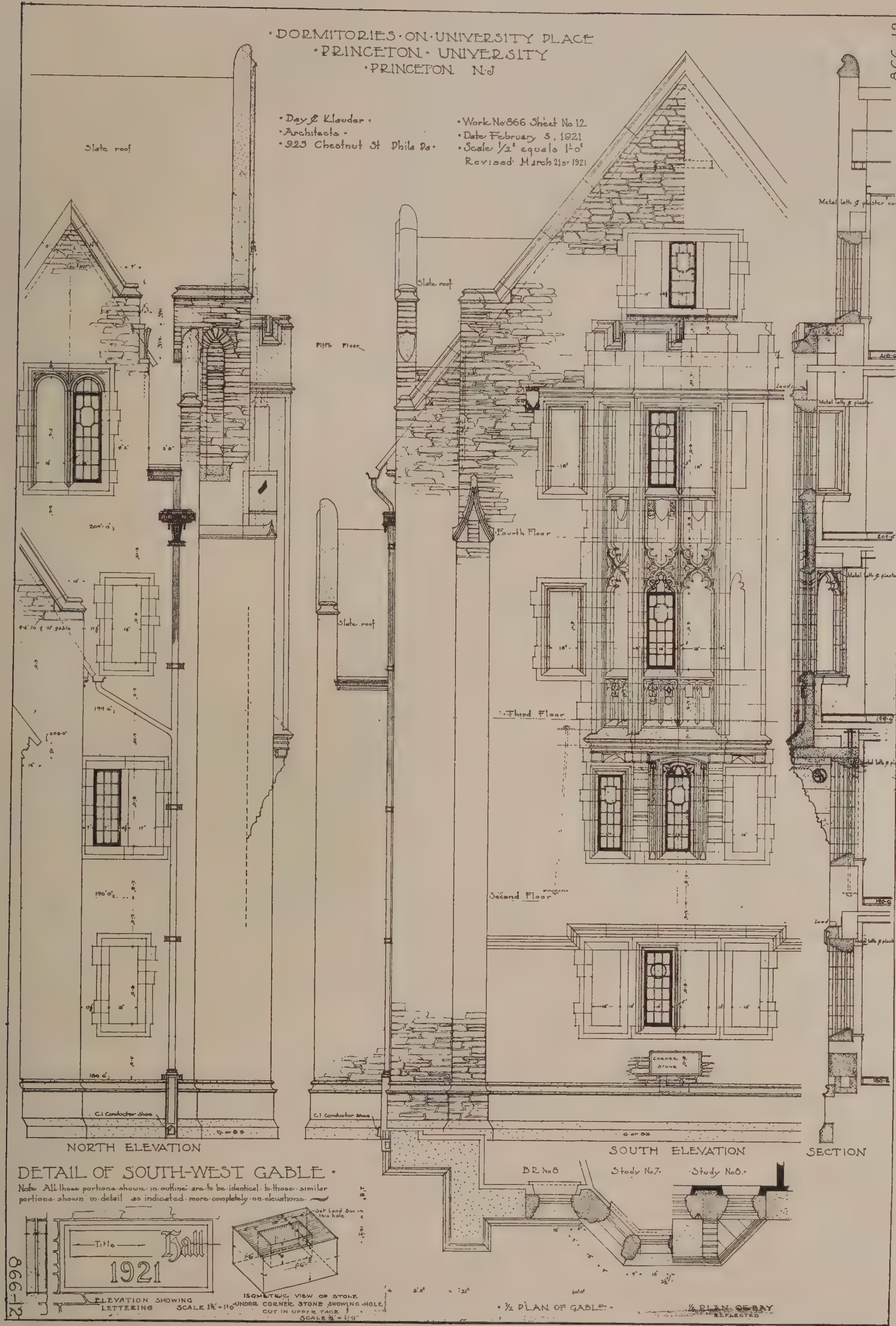
ELEVATIONS. PYNE HALL, PRINCETON UNIVERSITY, PRINCETON, N. J.

Day & Klauder, Architects.

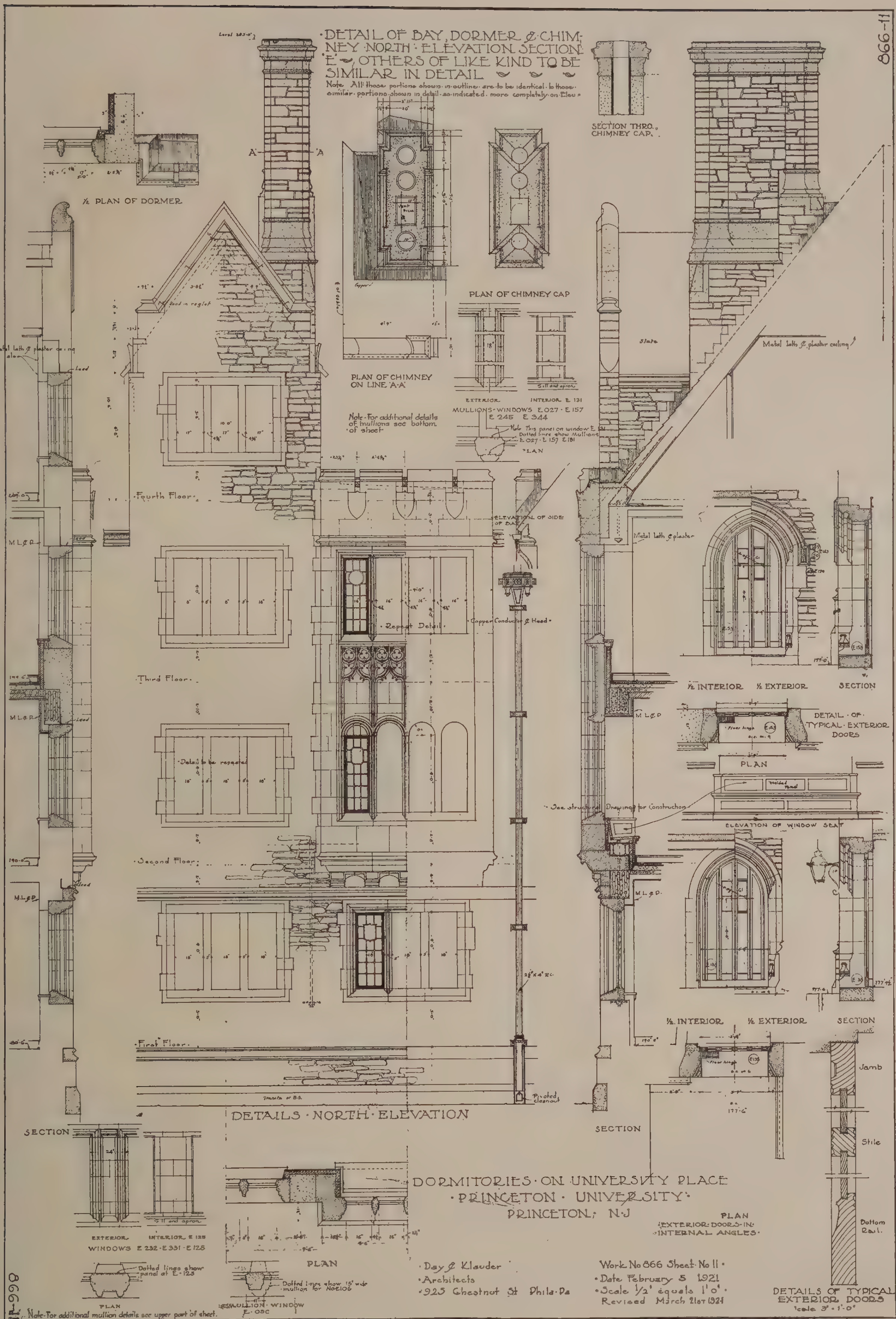


ELEVATIONS AND DETAIL, PYNE HALL, PRINCETON UNIVERSITY, PRINCETON, N. J.

Day & Klauder, Architects.



DETAIL, PYNE HALL, PRINCETON UNIVERSITY, PRINCETON, N. J. Day & Klauder, Architects.



DETAIL. PYNE HALL, PRINCETON UNIVERSITY, PRINCETON, N. J. Day & Klauder, Architects.

THE UNIVERSITY CLUB, BRIDGEPORT, CONN.

Walter John Skinner, Architect.

THE UNIVERSITY CLUB, BRIDGEPORT, CONN.

Walter John Skinner, Architect.

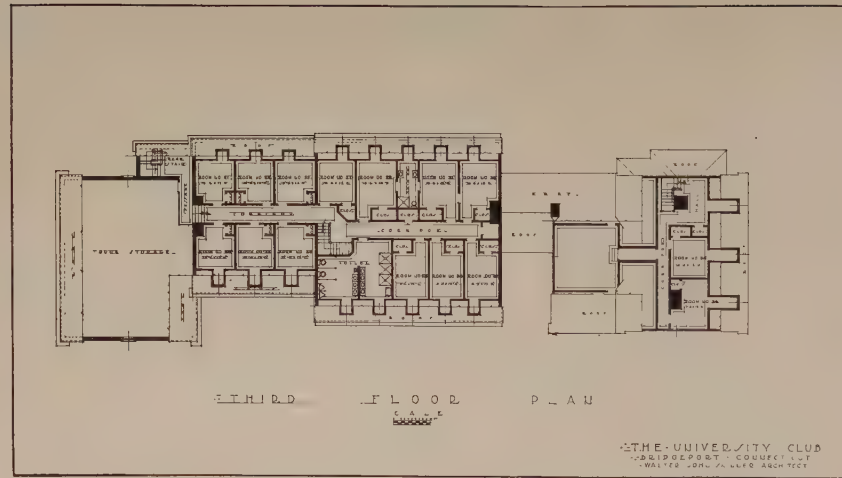
LIVING-ROOM.

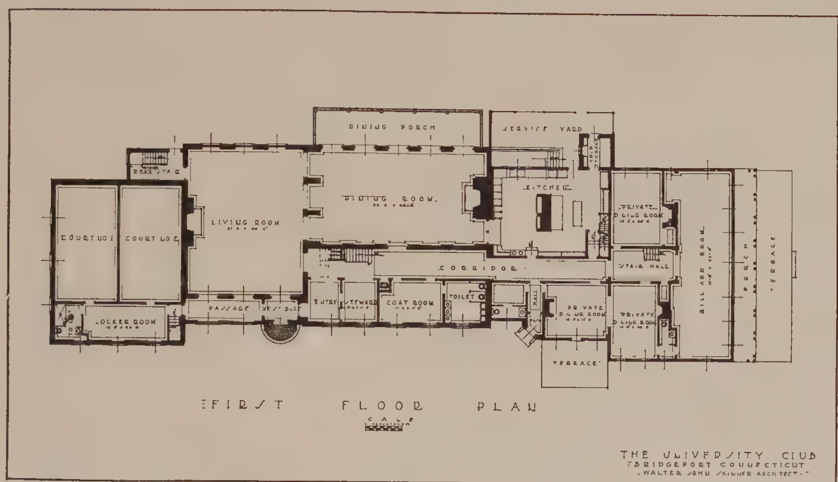
DINING-ROOM.

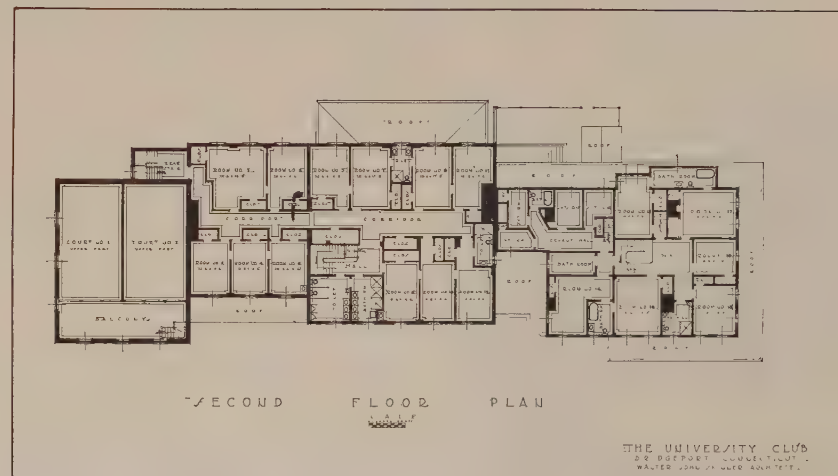
THE UNIVERSITY CLUB, BRIDGEPORT, CONN.

Walter John Skinner, Architect.

PRIVATE DINING-ROOM.

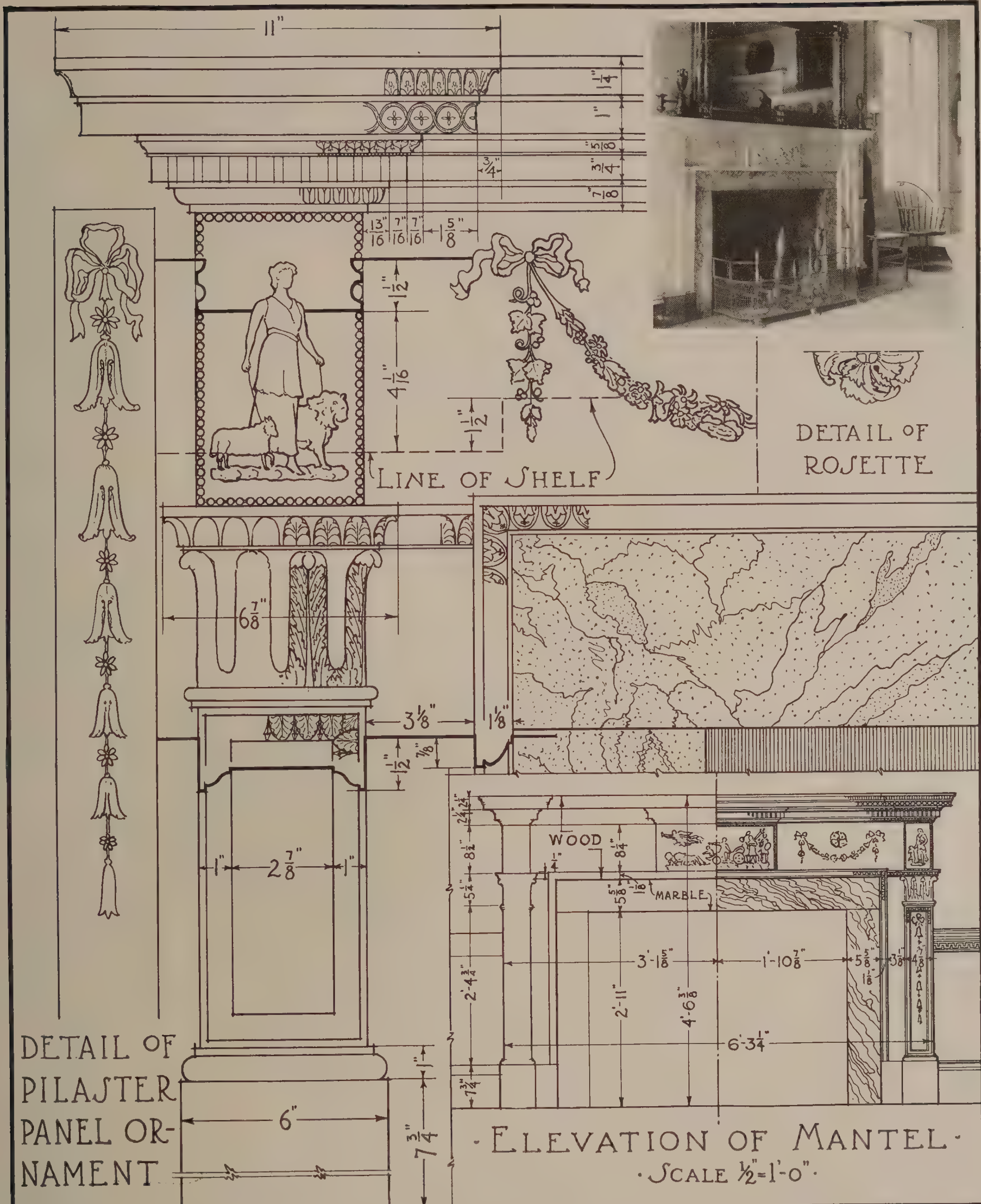






THE UNIVERSITY CLUB, BRIDGEPORT, CONN.

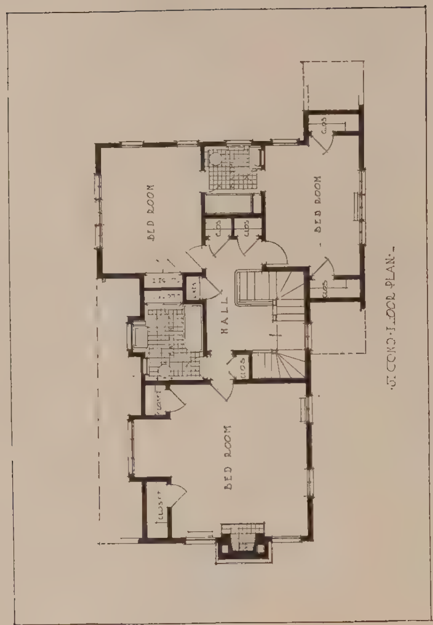
Walter John Skinner, Architect.

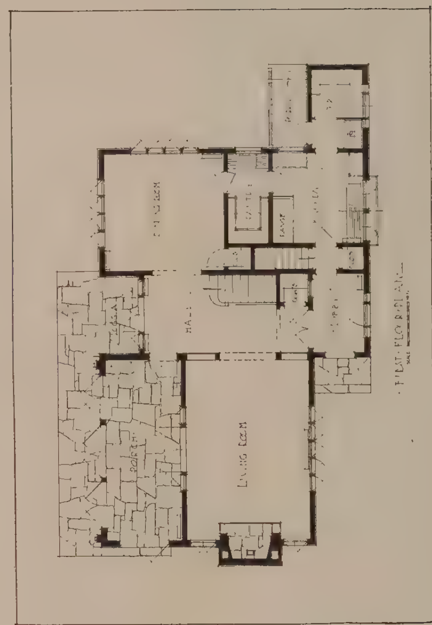


· SCALE OF DETAILS THREE INCHES = ONE FOOT ·

BOSTON COLONIAL SERIES	· MANTEL IN DINING ROOM · · HARRISON GRAY OTIS HOUSE : BOSTON MASS · BUILT IN 1794	MEASURED AND DRAWN BY G·R·MITCHELL

RESIDENCE, MISS EDITH BOGUE, MONTCLAIR, N. J. "The House that Lives." Clifford C. Wendehack, Architect





Clifford C. Wendehack, Architect.

VISTA THROUGH HOUSE, RESIDENCE, MISS EDITH BOGUE, MONTCLAIR, N. J.

"The House That Lives"

THIS name was given to the house illustrated in this issue, designed by Clifford C. Wendehack, architect, for Miss Edith Bogue, Montclair, N. J., by the Women's Club of Upper Montclair. They had selected it from the houses completed during the current year, to represent the model house during "Better Homes Week."

The unforeseen happens very often in architecture as well as in life, and the application of the above name, and the use that this house was put to, were unthought of and had no part in the conception of the plan.

"The House That Lives" was designed around the traditions of an old family. It is true that the character and individuality of an owner affect to a great degree the conception of an architect, both in the beginning and as an inspiration as the house is developed.

The site was a part of an old family estate, and faced what had grown in recent years to be a much-travelled thoroughfare. The garden, which the owner has developed for years on the rear of her own property, lay at the back of the plot.

The first essentials were under these conditions:

A plan which faced the garden and showed as little of the domestic life on the street side as possible. This basic fact, being similar to the English idea of home life, naturally suggested an English house in character as well as in use. It will be noted from the plan that, to accomplish this, the main entrance, although on the street, enters under the stairs, and the vista upon gaining admittance to the house is through the wide hallway out upon the terrace and garden.

Entrance.

The kitchen, storerooms, and service entrance are also in an unusual position in the front of the house. The dining-room and porch have the most uninterrupted view of the garden possible.

Another aspect of the problem was to get a completed product for between fifteen thousand and twenty thousand dollars. This modest cost makes the house of particular interest to the average home builder. Every foot of floor area of necessity had to count for its particular use and to obtain the largest possible sized rooms. The owner being a musician required in a simple layout the maximum open area on the first floor for acoustical purposes. While the rooms are informal in arrangement, they open into a long vista, as shown on the interior views.

The position of the sun porch lends itself to a formal opening into the living-room and gives a large floor area for entertaining. The double French doors make it possible to close the porch from the balance of the first floor, and afford privacy in connection with the garden.

On the second floor there are three bedrooms and two baths. The main bedroom was designed as a combination study and sleeping apartment, with a high ceiling extending well up into the roof space with an open fireplace and windows on three sides. This room connects with a private hall and bathroom and can be closed off from the balance of the house, forming a complete unit in itself.

The third floor contains two servant's bedrooms, bath, large storage closets, and a storage attic for trunks at the head of the stairs. Ventilation is provided in the roof space over these rooms and access is had through a scuttle.

A characteristic feature of this house was provided by the blue-stone flagging, which was on the site and previously used in connection with the old family homestead. This flagging was recut and used as paving on the walks, entrance steps, terraces, sun parlor, and fireplace hearths. In keeping with this rough flagging, the entire house is stuccoed with lime and cement, applied in an old-fashioned manner. The timberwork and exterior trim is of cypress, left in the natural finish direct from the saw. The shingled roof is of cedar and dipped in many color stains and graded from ten-and-one-half-inches to five-and-one-half-inches exposure. The sheet-metal worm is of copper antiqued with muriatic acid. A unique feature of this house, considering its cost, is the metal casements.

The interior is finished in rough sand and cement plaster throughout, stained in various colors with a coal-tar product. On the first floor gold is used to a small degree to give life to the plaster. The bedrooms are finished in yellow, tan, and blue, thus giving a wide variety of interest on the second floor.

The woodwork on the first floor is cypress, finished in a flat driftwood color. The beams in the ceiling are solid cypress and are partly structural. The old English character is completed with the stairs, which are massive and simple in design, and are built of solid cypress, resting on the first-floor joists and carried through to the second-story railing.

The bathrooms are done in black-and-white ceramic floor tile, vertical wall tile with a touch of black at the base and cap. The walls and ceilings from the top of the tile are a dull robin's egg blue. The fittings throughout are white. The bathrooms contain a generous linen closet.

In its simplicity and straightforward construction, in the omission of all unnecessary details, and the use of durable but inexpensive material, this house should live in reality as well as in spirit for several generations to come.

LIVING-ROOM, RESIDENCE, MISS EDITH BOGUE, MONTCLAIR, N. J. Clifford C. Wendehack, Architect.

Construction of the Apartment-House

By H. Vandervoort Walsh

Instructor of Construction, School of Architecture, Columbia University

ARTICLE VII

Stairway and Fire-Escape Construction

THE lives of those in apartment-houses depend more on the construction of the stairways, in time of fire, than on any other one part, and for this reason the greatest attention should be given to the details, both in the planning and the building of these exits. There have been many examples of the dangers of wooden stairs in tenement-houses, and many lives have been sacrificed in fires that have trapped the tenants upon the upper floors, smoking them to death, burning them, or driving them to jump from the upper-story windows. It is only in comparatively recent years that the building codes of some of the larger cities have prohibited wooden stairs. But even to-day one can step over the boundary-line of such a city as New York into one of its crowded suburbs and find there that new tenements are being constructed having in them very light and flammable wooden stairs. Not only have these buildings front stairs of wood, but at their rear they have wooden porches and wooden stairs instead of fire-escapes. It seems hardly possible in this enlightened generation that such criminally constructed buildings would be erected, but it is only an example, again, of the truth that builders will not build better than the minimum requirements of the law.

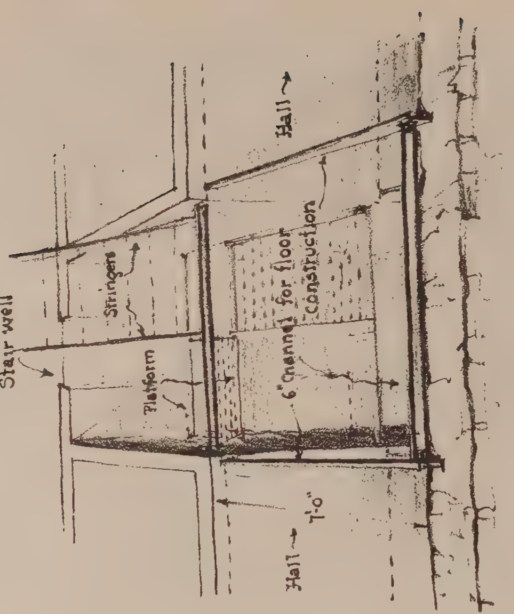
However, in the larger cities laws require that the main stairs of tenements over three stories high must be enclosed within a vertical shaft of fireproof construction, and that the stairs themselves must be built of metal or other non-combustible material. Another means of exit, too, must be located at another part of the building, so that all tenants may have two ways of escape, should one of them be cut off. In New York City this other means of exit is the fire-escape, which is very faulty, and ought to be replaced by either outside exit staircases or smokeproof towers. These fire-escapes consist of light open metal balconies, connected from floor to floor by ladders. A terrified group of people may easily congest such a means of escape, and if the fire is in those rooms opening onto the balconies, the people on the upper floors are entirely cut off, for no one can pass safely by the flames and heat issuing from the windows.

Even though the above is the case, these fire-escapes are practically the only thing built upon the tenements of New York City, and it is therefore very important that the main stairways be well constructed. Thus around all of the halls and stairs are erected 8-inch thick brick walls for fire-resisting partitions. The platforms and the floors are built of steel I-beams and reinforced-concrete slabs, covered with tiling. Where the front hall leading to the stairs passes under the second-floor apartments, the ceiling is constructed of steel beams and reinforced concrete. The steel beams are almost always 6 inches deep and the slabs of reinforced concrete 4 inches thick. Rarely are the soffits of the beams protected, and these floors are not as safe against fire as they would seem to be.

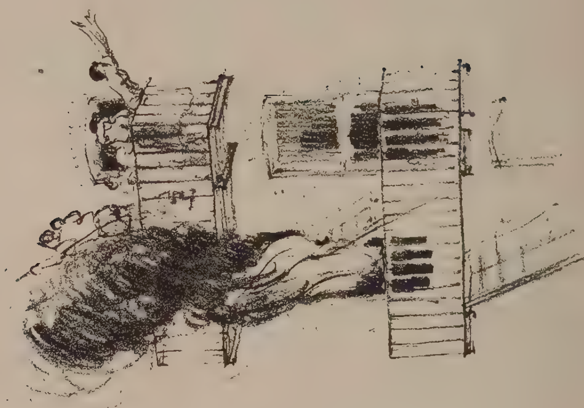
From the first floor up and out upon the roof, then, the stair-well and public halls at all floors are entirely enclosed within walls of brick or floors of reinforced concrete. Now in order to make this at all practical, it is necessary that the various doors which open into these halls be constructed of fire-resisting materials and have heavy, self-closing spring devices upon them, and so they are usually made of pressed sheet steel, or of wood covered with an outside layer of tin. None of the doors from the apartments are made less than 30 inches in width, and their frames are metal or wood covered with metal, and the sills are usually of marble. The lintels which support the brick walls over the tops of these doors are usually, for the small openings, that is the single doors, made of channels, placed U-fashion. But often two doors adjoin each other so closely that one large opening is necessary, and in such cases two 6-inch I-beams, held together with separators, are employed as the lintel. No attempt is made to fireproof these steel lintels, and it is certain that in very hot fires the collapse of them is sure to take place, but of course the brickwork above forms more or less of a cohesive structure, and the wall does not entirely break down.

The windows which light these stair-wells have frames of metal and also have metal sash and wire-glass. At the top the stairways are lighted with skylights, but these do not have in them wire-glass, only plain glass, which is protected below and above with wire screens. The mesh of such screens is made one inch or less and of No. 12-gauge wire. This screen is supported by metal strips, 6 inches above the top of the glass on the outside, and projects 6 inches beyond the edge of it. This same construction is employed on the tops of dumbwaiter shafts. The object of it, of course, is to permit the glass to be shattered by heat, allowing the hot gases and smoke to pass out at the top during a fire, and at the same time catch the shattered glass, holding it from falling down the shaft. The protection on the outside is also necessary against breakage under normal, every-day conditions.

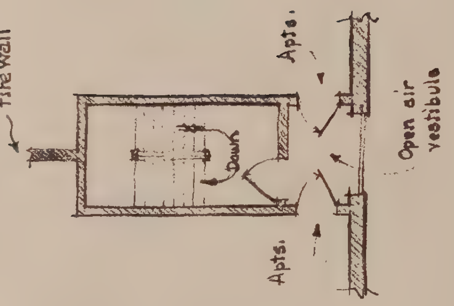
The stair-well, in ordinary tenements, is carried up through the roof, the exterior walls of this extension being merely a continuation of the 8-inch brick walls of the lower structure. The door out onto the roof is of the hollow metal type with heavy spring hinges on it, and the sill is placed about six inches above the level of the roof, to prevent any water overflowing it. The outside of the roof extension is practically always covered over with the same pitch that is used in laying the roof, for a brick wall of this kind is very porous and would transmit moisture down through it in a rain-storm of driving character. The interior walls of the shaft and of the halls are covered with plaster, applied directly to the brick without any furring or lathing. Now, although these walls are not exposed to the weather, yet there is a certain amount of moisture in them, and some of the bricks which are particularly dark will create a mark upon the decorations, applied to the plaster, through chemical action. That is, the colors of the wall-paper or paint over these bricks will be found to bleach out or be changed in tone. Some builders go over these walls with a waterproofing paint and put daubs over those bricks which have a questionable appearance, be-



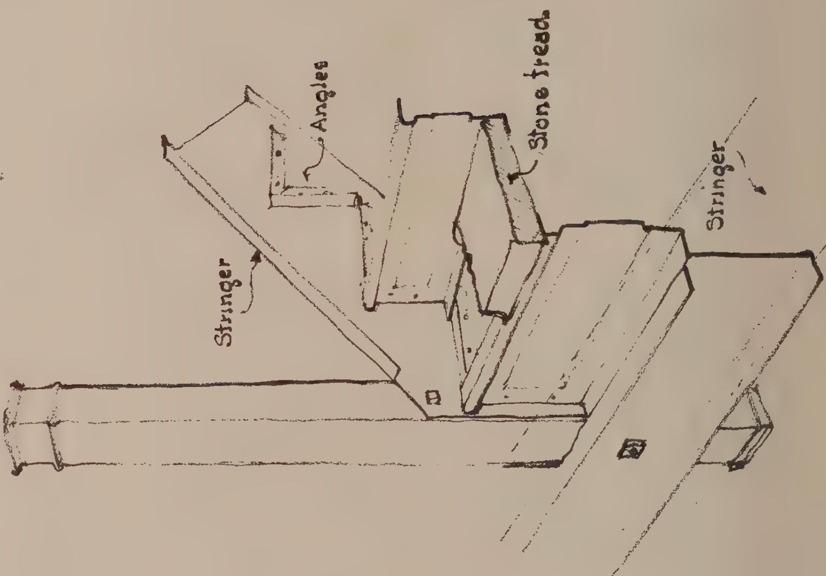
Framing for Stairs

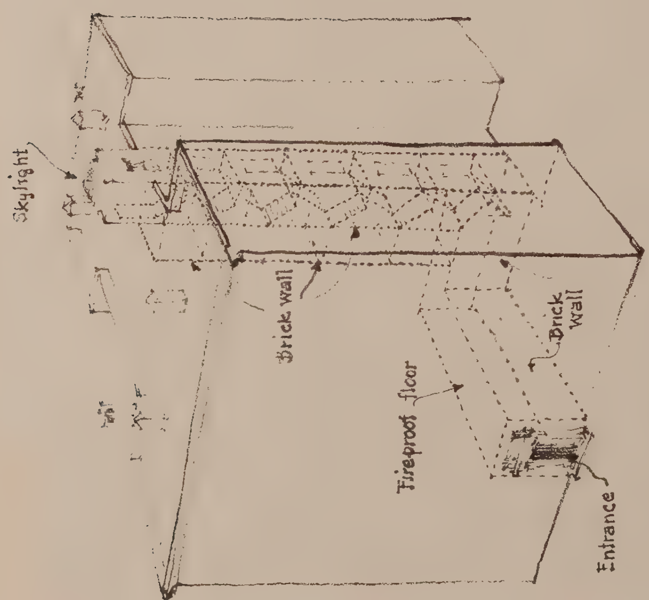


FIRE-ESCAPES ?

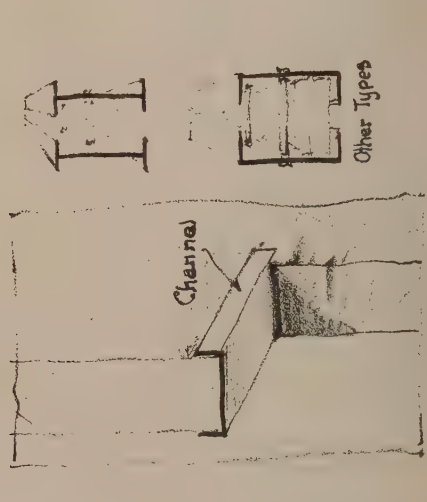


Smokeproof Tower





Stairwell and Halls



Lintel over Opening into Stairwell

fore the plaster is applied. If this is done carefully, none of this spotty effect will develop.

The flooring which is usually placed down on the landings and floors of the stairs and halls is the small hexagonal white tile, with a stock border pattern of colored tiles. It is almost a universal mistake. These floors of white tiles show every mark and every bit of dirt that is tracked into the building by the feet of children, peddlers, tenants and their friends. The superintendent will find that immediately after washing up the floors the dirt tracked in will seem to be as bad as before he tackled the job. It is discouraging, and more, these floors are not beautiful, for they are cold and uninviting for a public hall. Some builders of more individuality have broken away from this tradition, and have employed the same small tile, but used the dark-red ones, or have secured mottled patterns of red and black, or have used the 6-inch-square quarry tile. These floors have a much warmer and more inviting look, and at the same time do not show every little speck of dirt, and so seem to be clean at least once in a while.

The variety of methods used in decorating the walls of these halls is amusing, if one examines a large number. The newer apartments may have white, gray, or cream-colored wainscots of marble on the first floor, with plaster decoration above, either painted or stippled. The older apartments usually have dark paints and dark colors, so that the dirt which accumulates on the walls from the hands of children and furniture-movers does not show so much. These latter are very gloomy, especially when the floors are of white tile. The problem of how to secure light and artistic halls in tenements of ordinary construction is extremely difficult, if the landlord refuses to repair the walls regularly, or hard and permanent materials are not used in the beginning. The kind of tenants which live in these middle-class tenements in our large cities are very mixed, and children are numerous who delight in scratching their initials even into the hard marble wainscots, or pulling off the paper if there is ever so little a seam left standing, or taking their candy-covered hands and wiping them over the walls; and then the furniture-movers who are continuously parading up and down the stairs seem to be sure to catch the corners of the bureaus in the walls. Delicate, cheerful, and light decoration is doomed when such tenantry cares so little for it. We would probably have the landlords insisting on barrack-like halls under these conditions, if they did not also recognize that new tenants are attracted to their property by the character of the entrance and halls. Once these tenants are inside, however, they seem to think it is the other fellow's job to keep the halls decent.

So much imagination and skill in decoration is required for a problem of this nature that rarely does one find a solution of it in the thousands of tenements which are erected in our large cities. Usually some cheap wall-paper hanger is called in to do the job. The same old mistakes are made over and over again, and no advance is made.

This is particularly true when one considers the stairs which are erected in these buildings. From an architectural standpoint stairs can be made one of the charming features of a building, but the builders of apartment-houses do not seem to think so, even though they may be the only means of getting up to the various apartments. The stairs which are usually placed in these buildings are stock affairs. They conform to all the structural requirements of the building code, and are quite mechanically correct, but have not the slightest trace of charm or beauty in them. They are not much more than perfected fire-escapes.

It is true that they are 40 inches wide, as required by law, that they have steel channels to support them, that the stringers are metal, that the railings and the newels are of cast iron, and that the marble treads are supported underneath with steel, that there is a platform at least once in a story height, that the treads are not narrower than $9\frac{1}{2}$ inches nor the risers higher than $7\frac{3}{4}$ inches. They are quite mechanically correct and serve their purpose well, but such newels, such railings, such treads, such wall-stringers! As one goes from one apartment to another, it almost seems as though the same die and the same mould had been used by all the manufacturers of these stairs. And yet in looking through the catalogues of the manufacturers of these stairs, one can find designs that are more interesting, that are individual in character, but, of course, they are rare. They are more expensive, and this would make them seem impossible to the builder of apartments, who lavishes his money on other things, with less effect, such as stained-glass windows and brass railings at the entrance.

Although the ugliness of the average apartment-house staircase has not been noticed by the general public so much, yet it has noticed how awful are the fire-escapes. This secondary means of escape, used in practically all of the ordinary constructed apartments in New York City, mars the appearance of many an ugly front elevation. It is quite common to hear well-meaning folks say in pointing to a rather homely looking apartment, that it would be all right if it were not for the ugly fire-escapes on the front.

This is the usual way these fire-escapes are made. The balconies are 30 inches wide from the wall to the outside of the railing. The floors of the balconies are constructed of $\frac{1}{4} \times 1\frac{1}{2}$ inch flat iron bars, spaced 1 inch apart and held by crosspieces riveted to them, which are spaced about every 29 inches. This floor is held on four cantilever channels, 4 inches deep, or upon 3×3 inch angles that are riveted to form a rectangular frame that cantilevers out from the wall. The railings consist of round $\frac{1}{2}$-inch bars, spaced $5\frac{1}{2}$ inches on centres, held together at the top with a $1\frac{5}{8} \times \frac{1}{2}$ inch bar, and at the bottom by a $\frac{1}{4} \times 1\frac{1}{2}$ inch bar. The total height is made 34 inches. The ladders have risers of 9 inches and treads of 6 inches. The sides of the ladders are made of $\frac{1}{4} \times 4$ inch flat bars, and the treads of three $\frac{1}{4} \times 1\frac{1}{2}$ inch bars supported on 1×1 inch angles, bolted to the sides of the ladder. The hand-rail on the ladder is 16 inches above the sides, and consists of a $\frac{3}{4}$-inch round bar turned down at the ends for support, and braced by an upright bar at the middle.

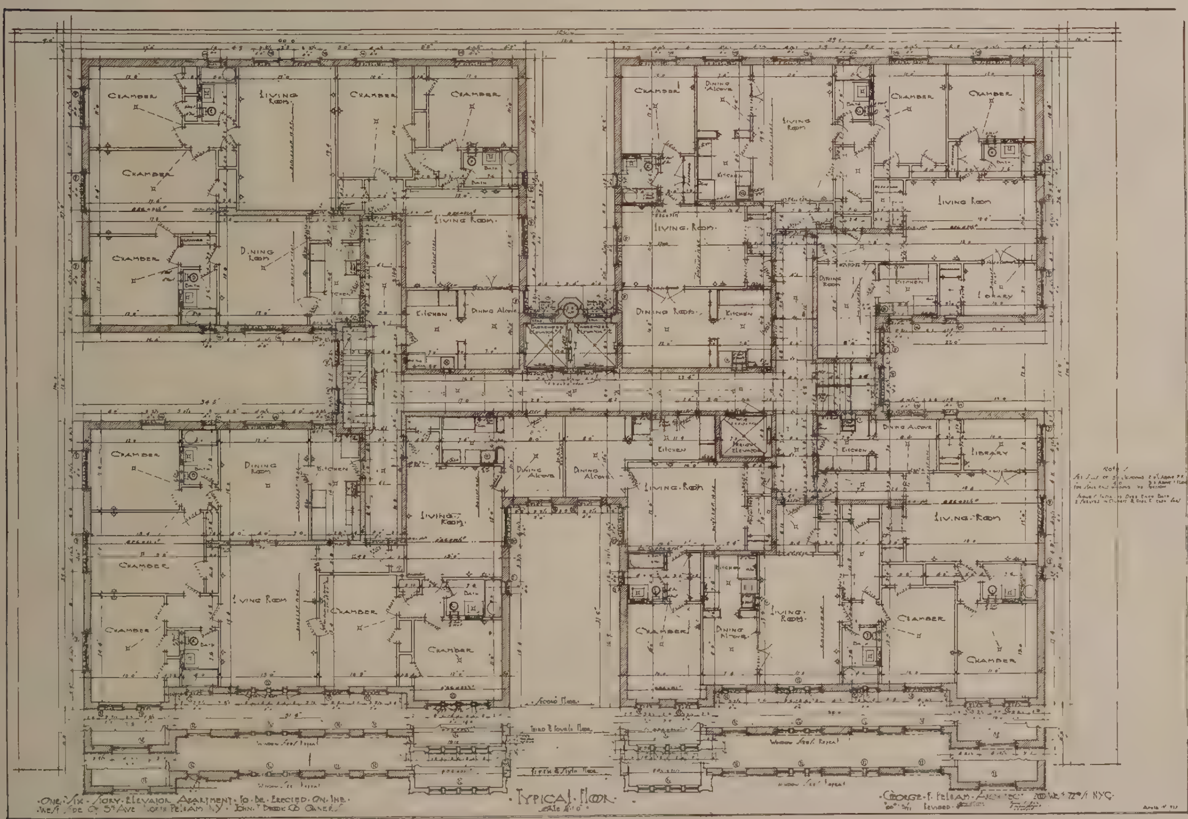
They have been made about this way for years, with perhaps a few slight variations, but the chances are they will continue to be made this way until they are abolished as an unsatisfactory means of escape in a fire and as an ugly addition to the front of the building.

What should be used is the smokeproof tower, which is a real non-combustible stairway, enclosed within fireproof walls, and which has a door at every floor upon an open-air vestibule, which in turn is accessible to the apartments through fireproof doors. Every open-air vestibule serves as a fresh-air cut-off, to prevent smoke entering the stairway, and it is necessary that the width be about 44 inches, and that the floor be solid and not open grid construction. The railings along the edge should be at least 4 feet high. Access to the balcony from the apartments should be through self-closing fire-doors, not less than 40 inches wide. Of course such an arrangement costs more money to build, takes up valuable space, and is altogether impossible, unless the law requires every one to build them.

(*To be continued*)

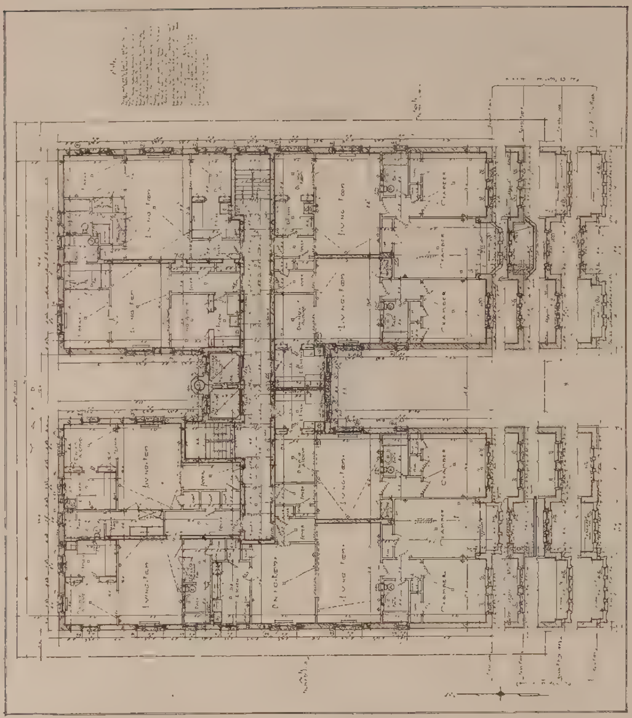
PELDEAN COURT AND PELBROOK HALL APARTMENTS, PELHAM, N. Y. Geo. F. Pelham, Architect.

VESTIBULE.

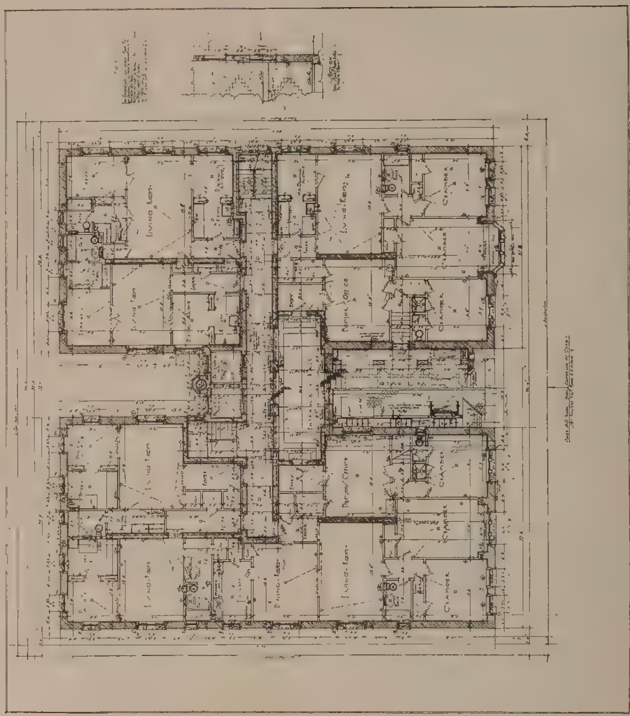


PELDEAN COURT, PELHAM, N. Y.

Geo. Fred Pelham, Architect.

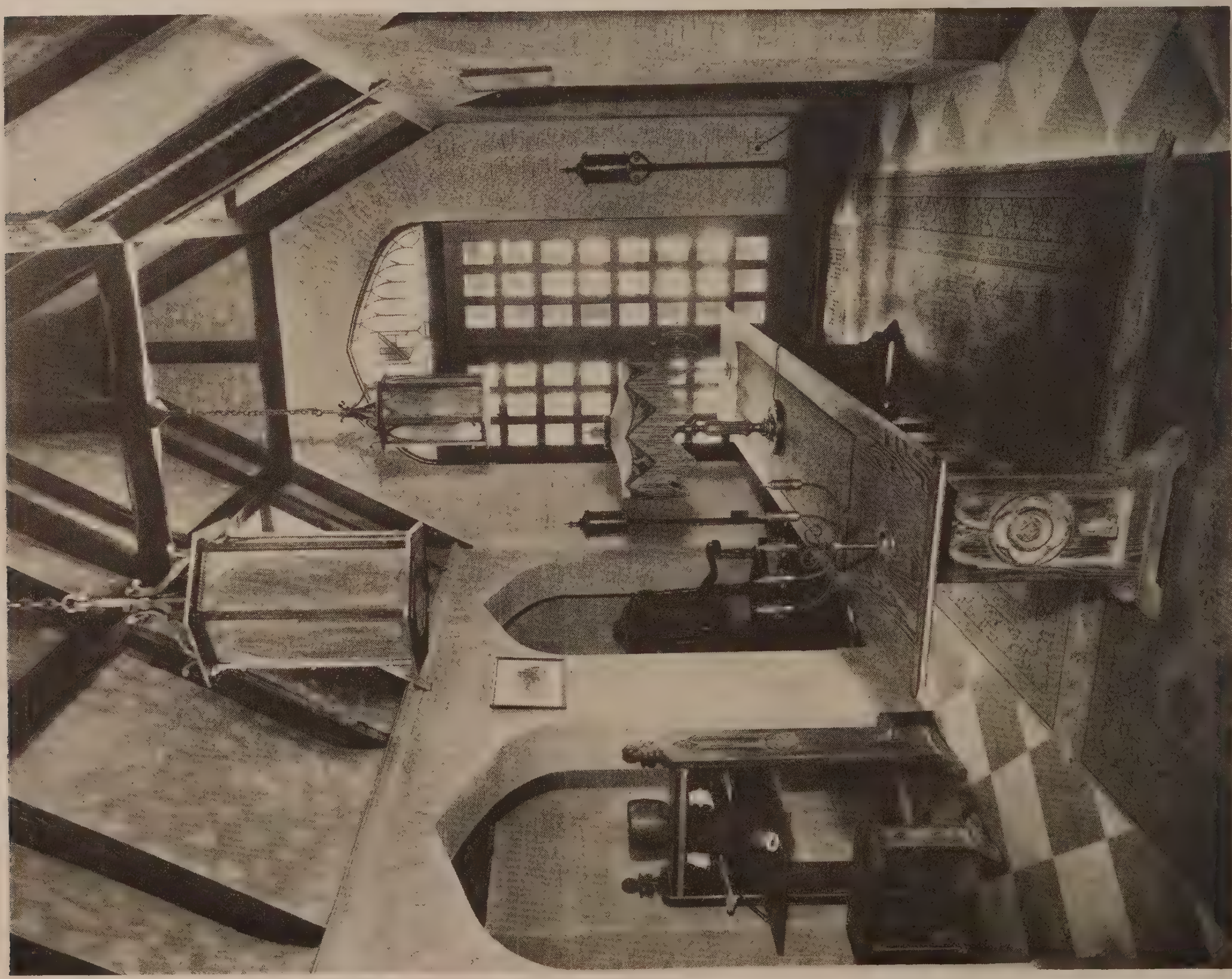


TYPICAL FLOOR PLAN.



FIRST FLOOR PLAN.

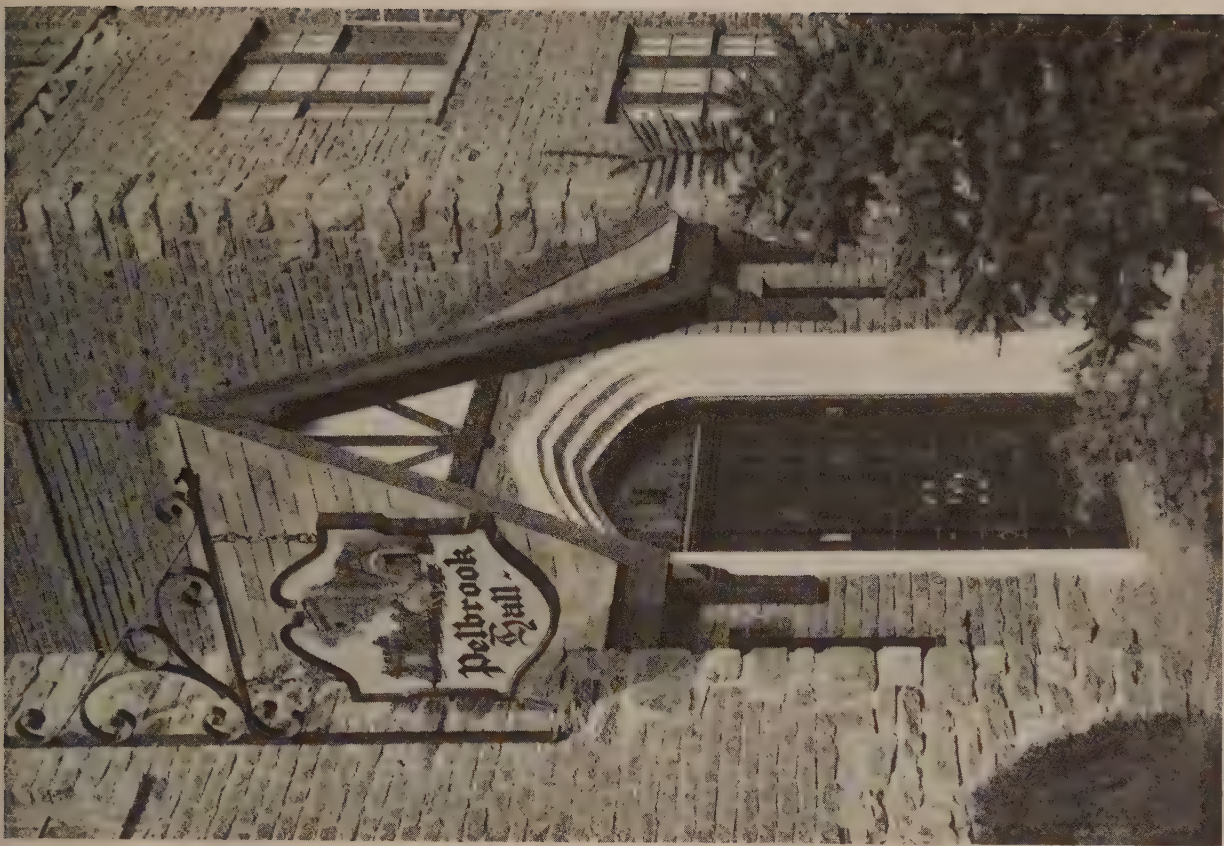
Geo. F. Pelham, Architect.



VESTIBULE.

PELBROOK HALL APARTMENTS, PELHAM, N. Y.

ENTRANCE, PELDEAN COURT, PELHAM, N. Y.



ENTRANCE, PELBROOK HALL, PELHAM, N. Y.

Geo. F. Pelham, Architect.

The Quality of Materials

By Richard P. Wallis

SECOND ARTICLE

TRAP rock, granite, gravel, marble, limestone, slag, sandstone, slate, shale, and cinders are all used for coarse aggregate, and are of relative value for concrete in the order named. This material should be hard and tenacious, clean, free from dust, and well-graded in size from particles $\frac{1}{4}$ inch in diameter up, in order to be of maximum value as an aggregate.

I. *Laboratory Tests:* (*a*) *Boiling Test.*—A good test to determine the general usefulness of an aggregate for concrete is the boiling test. Samples of the aggregate $\frac{1}{4}$ inch in diameter are placed in water and boiled. A rapid disintegration indicates a weak stone with a tendency to weather rapidly and generally unsuited for use as an aggregate.

(*b*) *Specific Gravity.*—The specific gravity of coarse aggregate may be obtained by suspending a sample by a thread from a chemical scale and noting its weight in air and while under water. The difference in weight is the weight of the water displaced. The specific gravity is then determined by dividing the weight of the aggregate by the weight of an equal volume of water.

II. *Field Tests:* (*a*) *Voids.*—The volume of voids in coarse aggregate may be determined by measuring the volume of water required to fill the voids in a given volume of aggregate.

(*b*) *Voids.*—The percentage of voids may be determined by applying the formula $P = 1 - \frac{W}{V}(G \times 62.5)$, where P = percentage voids, W = weight of sample, V = volume of sample and G = specific gravity of the solid stone from which the aggregate is taken.

The following values may be used for G:

Trap	2.9
Granite	2.7
Standstone	2.35
Gravel	2.65
Limestone	2.65

The material should be dried before weighing in order to eliminate the weight of any moisture that may be present. This dry material should be placed in the vessel for measuring in such a manner as to present a uniform degree of compactness. The voids are usually determined for a sample after it has been shovelled into the receptacle or by dropping it a short distance so as to slightly compress it.

III. *Inspection:* (*a*) *Trap Rock.*—The presence of iron pyrites (FeS_2) should be looked for. If present, the material should be rejected, owing to the tendency of the iron pyrites to break down into sulphuric acid.

(*b*) *Gravel.*—No gravel should be used in which clay or other material adheres to the pebbles in such quantity that it cannot be lightly brushed off with the hands or removed by dipping in water.

(*c*) *Slag.*—The use of blast-furnace slag for aggregate is of comparatively recent origin and for this reason its usefulness in concrete is not as fully appreciated as is other material. When properly prepared, slag makes an excellent aggregate, being light in weight, uneven and rough, and very tenacious.

Copper, lead, or basic open-hearth slag should not be used, as such materials are usually very brittle, have a glassy surface, and cause rapid disintegration of the concrete. Slag that shows signs of granulation has come in contact with water while hot and has become partially disintegrated.

Only slag that has been slowly cooled for this special purpose should be used as aggregate. No slag containing sulphur should be used, because of its detrimental action on the reinforcing. Slag should weigh not less than 70 pounds per cubic foot.

(*d*) *Cinders.*—Cinders to be used as aggregate should be hard, contain no fine ash, and should have been thoroughly wetted at least twenty-four hours prior to using, in order to slake out any free lime and neutralize the effect of any sulphur present.

They should contain but little unburned coal and should be free from soot. Cinders must not discolor the palm of the hand when held in it and rubbed with the fingers.

(*e*) *Broken Stone.*—When the coarse aggregate is in the form of broken stone care should be taken to see that the stone is of the size specified and that no crusher dust is present. In case dust is found in any large amount the stone should be rewashed.

D. Water

The water used in mixing concrete usually receives but scant consideration providing only it is wet. A general rule to follow is to use only that water that is fit for drinking purposes.

I. *Laboratory Tests.*—In case there is any serious question as to the quality of the water, and there is none other available, it is advisable to test concrete samples made with such water for strength.

II. *Field Tests:* (*a*) *Litmus Test.*—The litmus test determines whether the water is acid or alkaline, and in what degree. If blue litmus remains blue when placed in the water it indicates that the water is either neutral or alkaline, if it turns red it indicates that the water is acid in its reaction. If red litmus turns blue on being immersed it indicates that the water contains an alkaline. The speed at which the change takes place indicates the strength of the solution, a rapid change indicating dangerous amounts of acid or alkaline and a slow change small amounts of either. In the latter case the presence of acid or alkaline may usually be disregarded.

(*b*) *Hardness.*—It is sometimes desirable to ascertain whether the water is hard or soft, and to what degree. A simple test to determine the relative hardness is to add to the water a soap solution prepared by dissolving 1 part of pure white soap in 100 parts of 95 per cent grain alcohol, and adding 150 parts of distilled water or rain-water. The turbidity produced indicates the relative hardness, curdy flakes being formed with very hard water. No permanent

lather will be produced until sufficient soap solution has been added to precipitate all the calcium and magnesium salts.

III. *Inspection.*—The water should be carefully examined to determine the presence of the following impurities: oil and vegetable matter. The iridescent film on the surface is its own indication. Vegetable matter is generally apparent from the turbidity it causes.

E. Cement

The Portland cement in concrete or mortar is an artificial combination of clay and limestone, and as such should always be tested to determine its physical and chemical properties before it is incorporated in the concrete. The cement should be subjected to elaborate tests and analyses in order to demonstrate that it meets the requirements established by the specification. These tests are made preferably in specially equipped laboratories and a summary of the results furnished the purchaser.

I. *Laboratory Tests.*—Samples should be taken from each shipment for purposes of test; usually one sample to fifty barrels or fraction thereof, if in carload lots, or one sample to one hundred barrels when cement is taken from storage, preferably at the time of shipping, so that the report of the seven-day test may be received promptly and the cement either released or rejected without subjecting the job to unnecessary delay.

Where it is necessary to send the samples to be tested from the job, the following method of obtaining them is recommended. A number of sacks are selected at random from the shipment, preferably one sack for each forty in the shipment. Each bag is stood upside down and a thin pipe about $1\frac{1}{4}$ inches in diameter and 14 inches long is inserted through the flap in one corner of the bag that served as a valve at the time the bag was filled. The tube is then withdrawn and the contents laid aside to be combined with the other samples for shipment to the testing laboratory. The valve is then retied and the bag put back with the others.

The cement is tested for specific gravity, fineness, soundness, time of setting, tensile strength, and chemical analysis.

A summary of the requirements of the American Society for Testing Materials is here given. If further details are required reference should be made to the society's standard specification No. C 9–21.

Physical Characteristics

Specific Gravity.—The specific gravity shall be not less than 3.10.

Fineness.—The residue on a standard No. 200 sieve shall not exceed 22 per cent by weight.

Soundness.—A pat of neat cement shall remain firm and hard and shall show no signs of distortion, cracking, checking, or disintegration in the steam test for soundness.

Time of Setting.—The cement shall not develop its initial set in less than 45 minutes as determined by the Vicat needle or 60 minutes with the Gillmore needle. Initial set must occur within 10 hours.

Tensile Strength.—The tensile strength of a standard mortar shall be not less than as follows:

Seven days (1 day in moist air, 6 in water) 200 pounds per square inch.

Twenty-eight days (1 day in moist air, 27 in water) 300 pounds per square inch.

The average tensile strength of standard mortar at twenty-eight days shall be higher than at seven days.

Chemical Analysis.—The following limits shall not be exceeded:

Loss on ignition...........	4.00 per cent
Insoluble residue..........	0.85 per cent
Sulphuric anhydrid (SO_3)...	2.00 per cent
Magnesia (MgO)..........	5.00 per cent

Reports are made at the 24-hour period, 7-day and 28-day periods. Cements that pass the 24-hour and the 7-day tests may reasonably be regarded without suspicion, but cement failing to meet these requirements should not be finally rejected until failing to meet the requirements of the 28-day test, when it should be ordered removed from the job.

The supervisor should require that where cement is received in carload lots that separate storage facilities be provided for each shipment, in order to avoid confusing the approved cement with that which is being held subject to test.

II. *Field Tests:* (*a*) *Setting.*—A simple test to determine whether the cement sets within a reasonable time is as follows: Thoroughly mix a half cup of cement with sufficient water to form a paste that can be moulded into a compact ball in the hands. Place the ball on a piece of glass or metal and set it in the basement or other place where the temperature is between 50 and 80 degrees Fahr. and where it will not dry rapidly. At the end of from 24 to 48 hours the ball should be hard enough to resist a fairly heavy blow from a hammer.

III. *Inspection:* (*a*) *Color.*—The color of the cement tells something of its character. The standard color is a dull bluish gray. Any variation from this indicates the presence of impurities. Cement should not be accepted or rejected by this criterion alone.

(*b*) *Age.*—The Bureau of Standards reports that tests have indicated a reduction in strength for stored cement, but that this change was not marked for materials stored for a period less than a year. One lot that had been in storage for over two years gave the same strength in compression for 1 : $1\frac{1}{2}$: 3 concrete as was obtained from a 1 : 2 : 4 concrete made from the same brand of new cement. It will be seen that under ordinary conditions the age of the cement will have little bearing on its quality, as there is no reduction in strength occurring within the time in which most cement is normally used. The supervisor should, however, be advised as to the date of manufacture of the cement.

(*c*) *Stored Cement.*—Occasionally when cement has been stored for a considerable period of time, the bottom layers become caked, owing to the compression of the sacks in the pile above. A blow from a hammer will usually put such cement back into its former condition. Lumps that may readily be crushed between the fingers are good. Any lumps that cannot be thus readily crushed are partially set from absorbed moisture and should be rejected in order to insure the proper strength for the concrete that is to be made.

F. Reinforcing Steel

Steel for use in connection with concrete is divided into two grades; High Carbon and Mild Steel. Some building codes permit a higher unit stress for the former than for the latter. Steel is a manufactured product and as such should be subject to thorough tests before it is allowed in a structure.

I. *Laboratory Tests.*—The American Society for Testing Materials has prepared standard specifications for the

various grades. The contract should stipulate that reports of chemical analysis and strength tests be furnished the supervisor.

The before-mentioned specifications are A 15–14 for billet steel and A 16–14 for rerolled rail steel.

II. *Inspection:* (*a*) *High Carbon.*—This grade of steel is exceedingly brittle because of its high carbon content, and is subject to cracking during the process of bending. For this reason it should be closely inspected. A blow with a hammer will cause the rod to ring, providing it is free from cracks, otherwise only a dull sound will be heard.

(*b*) *General.*—All reinforcing steel should be carefully inspected to see that it is free from excessive rust, scale, or coatings of any character that would tend to weaken its bond with the surrounding concrete.

The Bureau of Standards reports that "galvanzing reduces the bond strength, but painting reduces it considerably more. Any coating allows a noticeable amount of slip in the case of deformed bars before the corrugations or lugs reach a firm bearing, but when they come to bearing, the bars act substantially as do uncoated bars of the same form. However, coated bars develop a smaller fraction of their maximum bond strength in attaining a slip of 0.001 inch than do uncoated bars."

G. Concrete

Concrete, both plain and reinforced, is one of the most useful of building materials. Its use is becoming more and more common in all types of construction, owing to its enduring qualities. A really efficient use of concrete has not been attained, owing to limitations necessarily imposed upon it in design, due to the variable quality of concrete that is met within the field. The use of laboratory methods in the field is impracticable, but it is possible to improve the strength, density, and uniformity by a strict observance of the rules of good practice and a thorough understanding of the theory underlying them.

I. *Laboratory Tests.*—Cubes of the concrete whose strength it is desired to obtain are sent to properly equipped testing laboratories and are there tested to destruction. Full-size members are occasionally tested in this manner both in practice and in the study of new theories and their application.

II. *Field Tests.*—The field tests are the more practical in that they may be conducted as the work progresses and the quality of the concrete maintained at the proper standard without subjecting the work to prolonged delay.

(*a*) *Slump Test.*—In order to determine the flowability of a concrete which is an index of its water content and hence its quality, the so-called slump test has been devised.

A sheet-iron cylinder 6 inches in diameter and 12 inches high is filled and thoroughly tamped with the concrete to be tested. The cylinder is then raised vertically by means of a windlass allowing the contained concrete to spread out as it will onto a sheet-metal plate. The reduction in height of the pile is a measure of the flowability, consequently of its fitness to be used in that particular bit of work for which it is being tested.

In ordinary reinforced concrete work the slump should be from 8 to 9 inches, that is, the 12-inch cylinder of concrete is only 3 or 4 inches in height after the cylinder has been removed. For certain classes of work where it is not necessary to make such a wet concrete the slump should be less. A slump of 4 inches is about right for ordinary plain concrete such as floors, sidewalks, driveways, footings, and basement walls.

(*b*) *Flow-Table Test.*—This test was developed by the Bureau of Standards to meet certain objections raised against the slump test. A metal-covered table that can be raised and lowered by means of a cam attached to a crank constitutes the equipment. The concrete to be tested is moulded in a cone-shaped form in the centre of the table. The form is withdrawn and the table-top raised and allowed to fall a certain number of times. For aggregates above 2 inches the core has a height of 6 inches, and upper and lower diameter of 8 and 12 inches, respectively. For smaller aggregate a height of 3 inches and diameters of 4 and 6 inches, respectively, are used. The form is removed and the table-top dropped fifteen times through a distance of ½ inch. The mass spreads out usually in a concentric manner. Where it is not concentric in outline the two diameters at right angles, the long and the short, are measured by self-reading calipers which are so graduated that the sum of the two readings represents the value of the flowability. This value may also be obtained by dividing the new diameter by the old and multiplying by 100.

(*c*) *Strength Tests.*—Occasionally when conditions require it, full-sized specimens of beams and slabs may be tested in the field by the use of suitable equipment for applying the load.

(*d*) *Frozen Concrete.*—The slow action of cement during cold, wet weather is a well-known, but frequently overlooked factor in the curing and setting of concrete placed during the colder portions of the year.

It is never safe, owing to the great risks involved, to remove forms from such concrete without having first carefully tested the concrete for hardness, penetration, and frost.

To do this thoroughly, tests should be applied not only to the slabs but also to the beams and columns, the forms for which should be so constructed as to permit of the removal of two sides without disturbing the supports.

Any concrete failing to satisfactorily meet the tests should remain supported, either until it is removed as defective or until other tests show that it meets the requirements of hard concrete.

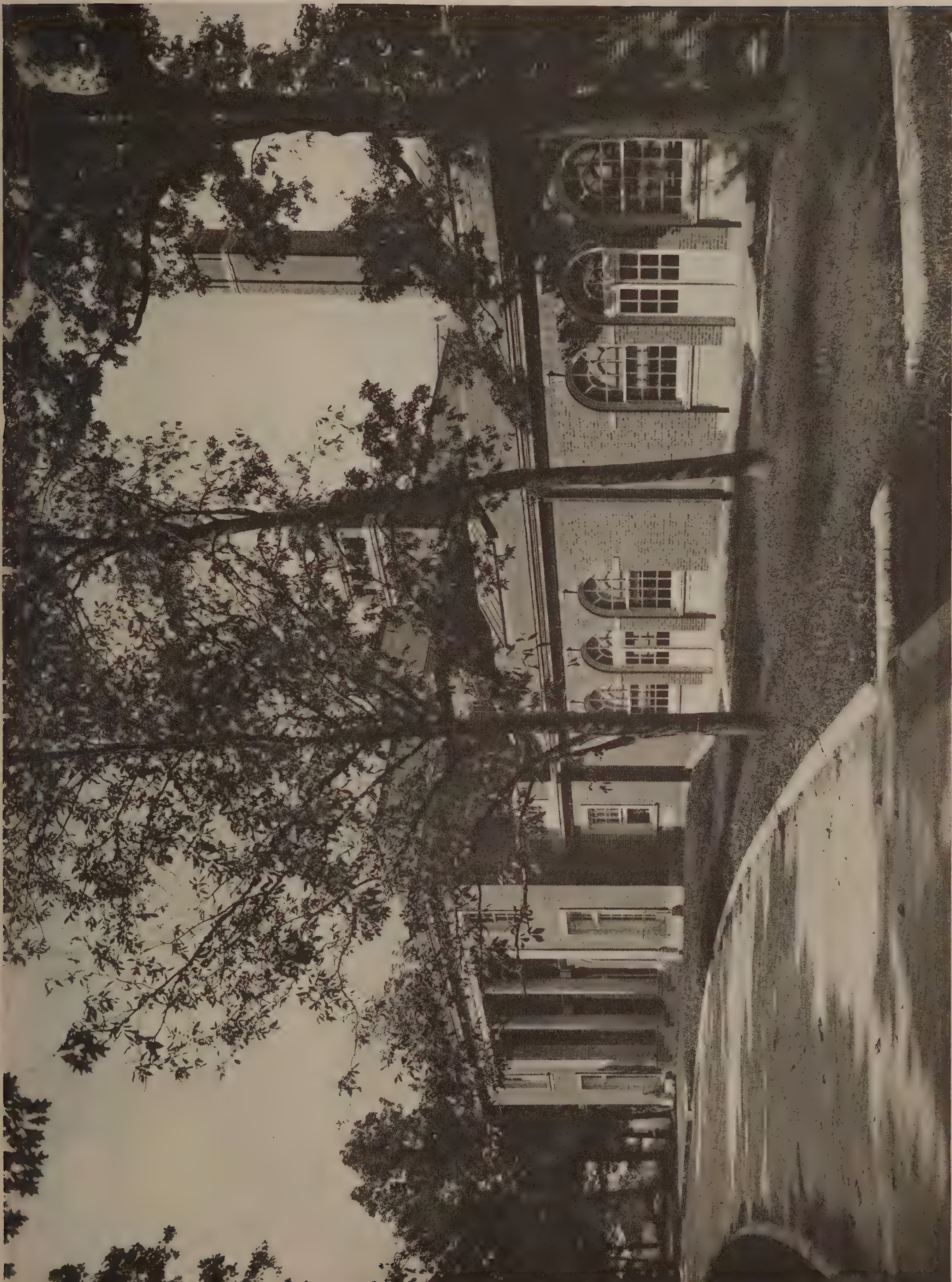
The method of testing is as follows:

1. Hardness. Strike the concrete with a hammer. A clear metallic ring should be heard similar to that obtained when striking a stone.

2. Frost. Frozen concrete, however, shows the same characteristics as hard concrete, therefore during winter months the concrete should be tested for fost. To make this test, play a gasolene torch upon the concrete or immerse a piece in hot water. If the concrete softens it is proof that it is frozen and not set.

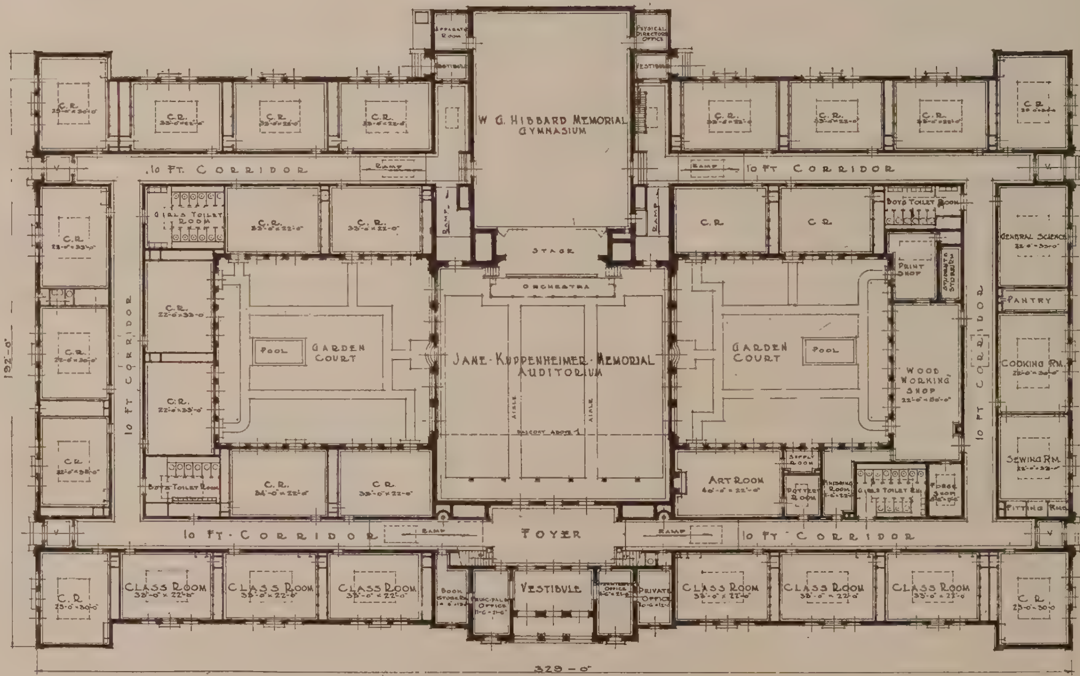
3. Penetration. The penetration test consists in attempting to drive eight-penny nails into the surface of the concrete. A well-set concrete will not permit these nails to enter. It is never safe to permit the removal of centring when eight-penny nails will enter the concrete.

(*To be continued*)



NEW SKOKIE SCHOOL, WINNETKA, ILL.

Perkins, Fellows and Hamilton, Architects.



FLOOR PLAN

PERKINS · FELLOWS AND · HAMILTON
ARCHITECTS · CHICAGO · ILLINOIS

·NEW·SKOKIE·SCHOOL·FOR·BOARD OF·EDUCATION · WINNETKA·ILLINOIS·

JANE KUPPENHEIMER AUDITORIUM. (Looking across stage toward W. G. Hibbard Memorial Gymnasium.)

GARDEN COURT. Perkins, Fellows and Hamilton, Architects.

NEW SKOKIE SCHOOL, WINNETKA, ILL.

Drafting-Room Mathematics

By DeWitt Clinton Pond, M.A.

TENTH ARTICLE

TO the readers of ARCHITECTURE who live outside of the city limits of Greater New York the following article which will deal with certain mathematical calculations connected with the Building Zone Resolutions, adopted by the Board of Estimate and Apportionment on July 25, 1916, may be of interest, for, although such a resolution has been adopted by comparatively few cities, still some similar regulations undoubtedly will be adopted in the future as a very practical method of governing the growth of cities, of protecting real-estate values, of insuring light and air for persons who "live, sleep, work, or congregate" in buildings, and of limiting the number of occupants of buildings in relation to the width of streets where such structures are located. This last-mentioned consideration is a very important one in a city like New York, for there are single buildings in the financial district in which there are as many people working as there are living in a great many villages in less densely populated parts of the country. If a sudden catastrophe should occur and all the people in the gigantic edifices were precipitated upon the streets, there would not be room enough in the streets of lower Manhattan to accommodate them. It was this consideration as much as any other that caused the authorities to enact such regulations as would limit the height and bulk of buildings in relation to the width of streets.

It is not the author's intention to give a full exposition of the setback regulations, but to call attention to such rules as are applied in the problems under consideration. The principles are the same as would be applicable in other problems created by the zoning regulations, and, although each problem must be considered on its own merits, still such calculations as are used in this article may be of some help in solving other problems.

It is generally understood that the city is divided into districts, and these districts come under three general heads, which are known as "Use," "Height," and "Area" districts. The considerations behind the division into use districts are fairly obvious, and can be appreciated by owners of property in any city. It is not desirable to have a store located next to a residence nor to have a blacksmith-shop next to a store, therefore restrictions are enforced which regulate and restrict the locations of trades and industries. In an article of this nature such restrictions are of only incidental value. The limitations imposed in height districts are of direct interest, however, and for this reason parts of Article III of the resolutions will be quoted as follows: "For the purpose of regulating and limiting height and bulk of buildings hereafter erected, the City of New York is hereby divided into six classes of districts: (*a*) three-quarter times districts, (*b*) one times districts, (*c*) one and one-quarter times districts, (*d*) one and one-half times districts, (*e*) two times districts, (*f*) two and one-half times districts, as shown on the height district map. . . ."

In following paragraphs there is explanation of what is meant by these designations, such as in a "one and one-half times district no building shall be erected to a height in excess of one and one-half times the width of the street, but for each one foot that the building or a portion of it sets back from the street line three feet shall be added to the height limit of such building or such portion thereof."

There are very important exceptions, two of which will be referred to in the calculations which follow. The first is given in paragraph *b*, section 9, of Article III. "Along a narrower street near its intersection with a wider street, any building or any part of any building fronting on the narrower street within 100 feet, measured at right angles to the side of the wider street, shall be governed by the height regulations provided for the wider street. A corner building on such intersection streets shall be governed by the height regulations provided for the wider street for 150 feet from the side of such wider street, measured along such narrower street."

The second exception which will be taken advantage of is given in paragraph *c* of the same section. "Above the height limit at any level for any part of a building a dormer, elevator bulkhead, or other structure may be erected provided its frontage length on any given street be not greater than 60 per cent of the length of such street frontage of such part of the building. Such frontage length of such structure at any given level shall be decreased by an amount equal to one per cent of such street frontage of such part of the building for every foot such level is above such height limit."

There is more in the paragraph from which the quotation is taken, and there are many other paragraphs, but the other exceptions will not be used in the calculations.

Now let it be assumed that the architect is given the problem of designing a building on a lot measuring 238 feet 4 inches long and 100 feet wide, and bounded on three sides by a street and two avenues. The two avenues measure 60 feet and 80 feet wide respectively, as shown in Fig. 42, and the street measures 60 feet wide. The district is a one and one-quarter times district, so on the street fronts of the building on the 60-foot street and avenue it is possible to carry the building 75 feet high before setting back. On the street front facing the 80-foot avenue it is possible to carry up the building 100 feet.

With these figures in mind, the next step is the determination of the curb height from which the heights given above must be measured. According to the definitions given in paragraph *d* the "curb level," for the purpose of measuring the height of any portion of a building, is the mean level of the curb in front of such portion of the building. "But where a building is on a corner lot, the curb level is the mean level of the curb on the street of greatest width. If such greatest width occurs on more than one street, the curb level is the mean level of the curb on the street of greatest width which has the highest curb elevation. . . ."

Also, in accordance with the definition in paragraph *f* the "height of a building is the vertical distance measured in the case of flat roofs from the curb level to the level of the highest point of the roof-beams adjacent to the street wall. . . ."

In the case under consideration the street, indicated as A Street in Fig. 42, pitches in both directions from a point the elevation of which is given as 120 in the survey. In

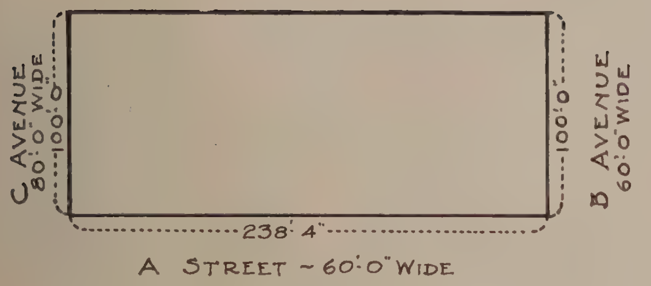


FIGURE 42

accordance with a special ruling the architects were allowed to take this elevation as the "curb level" for the entire building on all street fronts. Because of the steep pitch of all the streets this ruling made it possible for the architects to determine the height of the various street walls from a point higher by 2.83 feet than the first floor, the elevation of which has been taken as 117.17.

The next step is the drawing of the "setback diagram" which is shown in Fig. 43. For a building located so that there are three street fronts, there will be three such diagrams required, one for each street. In a diagram of this nature it is necessary to lay off the floors with the various story heights indicated as accurately as possible. Then, as far as graphic determination is possible, a point should be located at a distance away from the street wall equal to one-half the width of the street and at an elevation equal to that of the curb elevating—in the present case this elevation is 120. From this point draw a line through another point on the street wall at a height above the curb equal to one

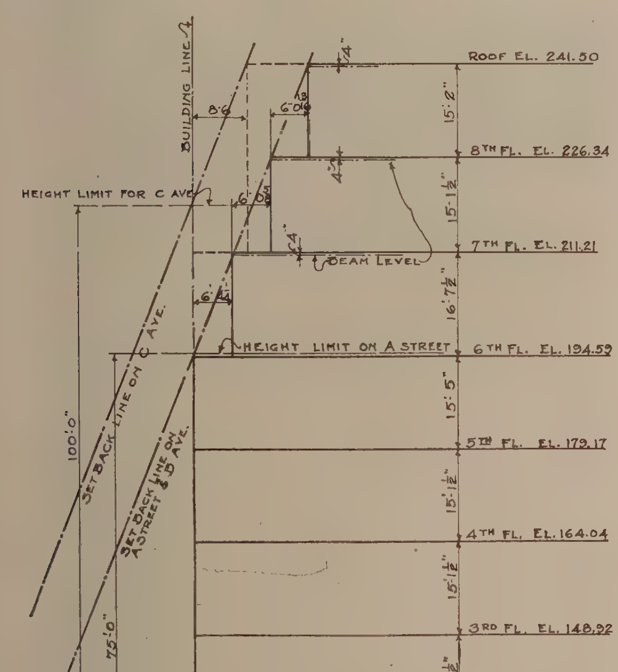


FIGURE 43

and one-quarter times the width of the street. This line establishes the limit within which the building must be built, with the exception that there are certain projections allowable, as stated above. On C and D Avenues the street walls will set back in accordance with the limits set by this line, as will be shown, but on A Street advantage will be taken of the exceptions.

On C Avenue, which is 80 feet wide, the allowable height of the street wall is 100 feet. The curb level has been established as 120, so the elevation of the point on the street wall where it intersects with the setback line is 220 feet. The elevation of the seventh floor, as shown in Fig. 43, is 211.21, so it will be possible to carry up the street wall to this height—six stories—before setting back. The eighth floor has an elevation of 226.34, which is 6.34 feet above the limit allowed by law, therefore the street wall must be carried as high as the parapet above the seventh-floor level, and then the wall must be set back. In the problem under consideration it was decided that, instead of setting back at every floor, the position of the wall above the seventh-floor level would be determined by the point at which the line representing the level of the roof-beams should intersect with the setback line. The roof elevation is 241.50, but the beams are 4 inches below this, so the line representing the beam level will be at an elevation of 241.17, which is 21.17 feet above the height limit. Now in a one and one-quarter times district "for each one foot that the building or a portion of it sets back from the street line two and one-half feet shall be added to the height limit of such building or such portion thereof." In accordance with this, if 21.17 feet is the height that it is desirable to carry the building above the height limit at the building line, then the distance that it is necessary to set the wall back can be determined by dividing 21.17 by 2.5. This gives a result of 8.47 feet, or 8 feet $5\frac{5}{8}$ inches. The wall was actually set back 8 feet 6 inches.

The question might be asked as to how such a result could be obtained graphically by drawing a line through points, one at the centre of the street at the curb elevation and the other at the height limit on the building line, and establishing the points of intersection at the various floors at which the setbacks occur. The explanation is that if the horizontal distance from the building is one-half the width of the street—in this case 40 feet—and the height limit is one and one-quarter times the width—100 feet—the ratio between the horizontal and vertical legs of a triangle established in this manner is one to two and one-half.

The method of determining the setback which has just been given is so simple that nothing but the most rudimentary arithmetic is required. There are cases, however, where it is more simple to use logarithms, as, for example, where it is necessary to determine the setbacks on B Avenue. This avenue is only 60 feet wide and the height limit at the building line is 75 feet above the curb level, or at an elevation of 195 feet. This is almost the same as the elevation of the sixth floor, so that on B Avenue the street wall can be carried up five stories before it is required that the wall should set back. Above this floor it was required that the wall be set back at each story.

The distance from the height limit to the top of the seventh floor beams is found by subtracting 4 inches from the elevation of the seventh floor—to find the elevation of the beams—and then subtracting 195 from this:

$$211.21 - .33 = 210.88$$
$$210.88 - 195 = 15.88$$
$$15.88 \text{ feet} = 15 \text{ feet } 10\tfrac{9}{16} \text{ inches}$$

The height from top of beam to top of beam in the seventh story is 15 feet $1\frac{1}{2}$ inches, and in the eighth story is 15 feet 2 inches. The logarithms of these dimensions are given below:

$$\log 15 \text{ feet } 10\tfrac{9}{16} \text{ inches} = 1.20086$$
$$\log 15 \text{ feet } 1\tfrac{1}{2} \text{ inches} = 1.17970$$
$$\log 15 \text{ feet } 2 \text{ inches} = 1.18089$$
$$\log 2\tfrac{1}{2} \text{ feet} = 0.39794$$

The calculations required for the determination of the setback distances are extremely simple:

$$\begin{array}{lr} \log 15 \text{ feet } 10\tfrac{9}{16} \text{ inches} & = 1.20086 \\ -\log 2\tfrac{1}{2} \text{ feet} & = 0.39794 \\ \hline & 0.80292 \end{array}$$

$$0.80292 = \log 6 \text{ feet } 4\tfrac{1}{4} \text{ inches}$$

$$\begin{array}{lr} \log 15 \text{ feet } 1\tfrac{1}{2} \text{ inches} & = 1.17970 \\ -\log 2\tfrac{1}{2} \text{ feet} & = 0.39794 \\ \hline & 0.78176 \end{array}$$

$$0.78176 = \log 6 \text{ feet } 0\tfrac{5}{8} \text{ inches}$$

$$\begin{array}{lr} \log 15 \text{ feet } 2 \text{ inches} & = 1.18089 \\ -\log 2\tfrac{1}{2} \text{ feet} & = 0.39794 \\ \hline & 0.78295 \end{array}$$

$$0.78295 = \log 6 \text{ feet } 0\tfrac{13}{16} \text{ inches}$$

The advantage of the use of logarithms is found in obtaining the distances in terms of feet and inches directly, without the need of referring to tables of decimal equivalents.

So far the setbacks have been determined without taking advantage of the exceptions.

The method of making use of such exceptions is fairly complicated and will be described in the next article.

Book Reviews

TOM TOWER, CHRIST CHURCH, OXFORD. Some Letters of Sir Christopher Wren to John Fell, Bishop of Oxford, Hitherto Unpublished. Now set forth and annotated by W. DOUGLAS CARÖS, M.A., Cantab., F.S.A. With a chapter by H. H. TURNER, Esq., D.Sc., D.C.L., F.R.S., and another by ARTHUR COCHRANE, Esq., Chester Herald. Oxford University Press, American Branch, New York.

The author had intended an extensive architectural record of the college, but the war put a stop to it, and this volume is confined to Wren's letters and his immediate association with the college.

In the introduction he says: "I am conscious that its pages are scattered, discursive, and perhaps often merely colloquial," but withal there is much to enjoy, and in Sir Christopher's letters we find that he was an architect of resources and that he had his troubles with the good bishop his client. The conditions that govern the work of the architect have apparently not changed since Sir Christopher's days, as the letter below shows.

He was very fortunate in having so competent a builder as Christopher Kempster, to whose industry and experience the architect paid due tribute. There is a life sketch of this worthy gentleman and a copy of the building contract; also the history of Great Tom, the bell that gave the famous tower its name. The illustrations include portraits of Sir Christopher, a particularly fine one from the painting by Michael Wright, and there are views and plans of the tower, with other details.

It is distinctly a book for the architect and collector's library.

"Letter VI, Dec. 3, 1681.

"MY LORD

"As farre as I can perceiue by discourse with Mr. Kempster you haue hitherto proceeded very well in your Building & I hope I shall haue noe reason to beleiue otherwise when I see it and I should be glad you would proceed upon the first thoughtes, Yet I doe not reject your Lps proposition of making it into an Observatory, & I was willing first to get rid of severall businesses that incombred me at once the last weeke that I might at leasure consider of this change for a Change it will be of the whole designe; for the Loft for the Bell aboue the ringing loft must be higher considerably & with large Windowes & still I doubt the Bell will be somwhat lowe to be well heard; then the octogonall Tower must be flat on the Top with a levell Ballaster (for pinnacles will doe injury) the windowes also must be only wooden shutters without Mullions or barres, these things considered it will necessarily fall short of the beauty of the other way, for having begun in the Gothick manner wee must conclude aboue with flats & such proportions as will not be well reconcilable to the Gothick manner wch spires upward & the pyramidall formes are essentiall to it, & this proposition had been much better effected had not the parts formerly built diverted us from beginning after the better formes of Architecture, & I feare wee shall make an unhandsome medly this way. . . ."

A SYMBOL OF SAFETY. An Interpretative Study of a Notable Institution, Organized for Service, not Profit. By HARRY CHASE BREARLY. Doubleday, Page & Co.

The Underwriters' Laboratories have grown in thirty years into a really great and useful organization. Their work means a saving of millions of dollars and many lives, and the spreading of information of vital interest to every one. This story of the development and work makes interesting reading. Fire-fighting and the protection of human beings from the hazards of handling dangerous modern contrivances have become a science.

ENGLISH INTERIORS IN SMALLER HOUSES. From the Restoration to the Regency, 1660–1830. By M. JOURDAIN, Author of "English Decoration and Furniture of the Eighteenth Century," etc. Charles Scribner's Sons, New York.

Miss Jourdain's books are above all characterized by a fine clarity in the writing. She knows essentials and tells you about them in terms that make you see them and appreciate their place in the decorative scheme.

We have learned much from the English home, and we may go on profiting by the long years of selective good taste that are associated with them.

The material in this handsome and profusely illustrated volume is largely drawn from smaller houses in country and town, but finds a place for minor rooms from larger houses, which have frequently marked individuality in restraint. After a brief introductory text, referring to social life, and showing the aims and ideas of contemporary designers, the author presents a continuous series of complete interiors. Then large and important sections are devoted to all the chief features of the Interior, each with a pithy introductory note, in which the main types are pointed out. There are chapters on Panelling and Wall Treatment; Staircases; Halls, Passages and Corridors; Doorways and Doors; Windows; Ceilings and Plaster Decoration; Chimney Pieces, etc.; while a number of houses of interest have been fully illustrated with brief monographs. Among the architects of the seventeenth and eighteenth centuries whose Decorative Work or Designs are represented are William Palman, Thomas Ripley, William Kent, James Paine, Robert and James Adam, Thomas Leverton, Henry Holland, James Wyatt, George Richardson, Cardom, and Charles Inwood, together with many unknown artists and craftsmen. Great efforts have been made to present both Interiors and Features to a good scale, with all possible clearness. The majority of the subjects have been specially photographed, and many have not been illustrated. A series of measured drawings is also included—the equivalent of about twenty plates, by the Honorable H. Pakington, Professor A. E. Richardson, T. Smithers, A. J. Ashdown, and others, showing proportions, panelling and ceilings, with mouldings, detail and plans, usually prepared specially. In each section special attention is devoted to illustrations of characteristic detail.

Large illustrations of Woodcarving, Plaster Modelling, Chimney Pieces, Brackets and Balusters of Staircases, Door Heads, etc., all find a place, and the author includes subjects not very frequently illustrated, such as Corridors, Landings, Bay Windows, Curved Rooms, Niches, Alcoves, etc.

ARCHITECTURAL BUILDING CONSTRUCTION. By WALTER JAGGARD, Fellow of the Royal Institute of British Architects, and FRANCIS E. DRURY, Fellow of the Institution of Sanitary Engineers. Volume two. Part two. The Macmillan Co., New York.

This is an English book dealing with English methods and practice, but it should be of value to American architects. The volumes are intended for "the student, architect, builder, and craftsman."

There are many excellent illustrations of constructive details.

"FOUNDATIONS, ABUTMENTS AND FOOTINGS"—"STRUCTURAL MEMBERS AND CONNECTIONS." Compiled by a Staff of Specialists. Editors in chief, GEORGE S. HOOL, Professor of Structural Engineering, University of Wisconsin, and W. S. KINE, Professor of Structural Engineering, University of Wisconsin. McGraw-Hill Book Co., Inc., New York.

These are the first and second volumes of a series of six intended to provide the engineer and the student with a reference work covering thoroughly the design and construction of the principal kinds and types of modern engineering structures. Each volume is a unit in itself, and each may be used as a text-book without the use of the other volumes. They are books of great value and authority in their special field.

Display building, Restrick Lumber Co., Detroit, Mich. Abraham & Woods, Architects.

The Restrick Lumber Company

THE Restrick Lumber Company, of Detroit, have a new main-office building which is one of the most attractive in the Middle West.

Why not, they asked when planning the new building, have the different woods and building products demonstrated in a practical, usable manner? That is just what this company has done.

When a builder or an architect mentions "clear oak flooring" or "No. 2 quarter-sawed," the client has only a very vague conception of what is meant.

Restrick reasoned that it would be a big help to the contractor and the builder if there would be a place—a permanent display—where they might easily show a customer the different materials and the different finishes.

Right there, in their own front yard, the Restrick Lumber Company has put across a capital advertising idea—and besides have a beautiful, practical office.

The building is a modern adaptation of domestic old English architecture, with a thatched effect shingle roof. It has an art brick exterior and casement windows, with leaded glass, overlooking the boulevard—one of Detroit's main thoroughfares. The interior, as suggested, provides not only for the main offices but artistically displays the many different woods and products and their finished appearance.

Lighting Up the Shriners in Their Pullman Hotels

NEARLY 400 Pullman cars were used in the several yards of the Pennsylvania Railroad as hotels during the recent Shriners Convention in Washington, accommodating 10,000 delegates, and in order to keep the Pullman storage batteries charged to furnish light and power for the electric fans, 130 Farm electric lighting plants, with a capacity of $1\frac{1}{2}$ kilowatt, were installed between the tracks on skids, each machine charging three cars at once.

These little plants are in common use for lighting farms, country homes, stores, etc., throughout the country, but this is the first time they have been used on such a large scale on a single job.

To grasp the magnitude of this installation, one must visualize 400 cars scattered in groups of three in eight different yards around the city of Washington. No two plants were nearer than 200 feet of each other, and in many cases they were several hundred yards apart.

The Production of Plate Glass

THE Plate Glass Manufacturers of America have exploded the rumor of a plate-glass shortage. For 1923 is to break all records in plate-glass production. There will be an output of about 90,000,000 square feet—enough to glaze a continuous store front 6 feet high from New York to San Francisco.

Manufacturers of plate glass were handicapped during the first quarter of this year. There were "cold repairs" to make in the rebuilding of badly worn furnaces. Other items of equipment interrupted production with their demands for attention. Yet figures compiled by P. A. Huges, secretary of the Plate Glass Manufacturers of America, show that during that period 19,952,154 square feet were supplied by the country's factories. In spite of production difficulties there was an output approaching the largest ever before recorded for a three months' interval.

Continuing at this rate, 1923 will show a total of 90,000,000 square feet.

Announcements

The P type panel-board manufactured by the Frank Adam Electric Company of St. Louis, Mo., is a new idea, an entirely different kind of panel-board. Particular attention should be given to the sectional construction of this as differentiating it from the old, one-piece boards.

We acknowledge an attractive illustrated booklet showing "Specimens of Bronze Work," by the Chicago Architectural Bronze Company.

The researches of the Structural Materials Research Laboratory at Lewis Institute, Chicago, have developed many previously unknown principles regarding concrete making. These principles, since verified by thousands of tests, are explained in the bulletins of the laboratory. To make the information contained in these bulletins more readily available to the busy engineer, architect, and designer, the Portland Cement Association has now published a booklet, "Concrete Data for Engineers and Architects," which contains the laboratory principles in brief form. A copy of this booklet will be sent upon request. Though abbreviated from the original reports, the principles are fully explained by both text and illustration. In addition, the booklet is of convenient size for filing and instant accessibility.

At a meeting of the Architectural Club of New Haven, of New Haven, presided over by Alfred A. Boylen, vice-president of the club, Leo R. Hammond was unanimously elected secretary of the club in place of Philip Sellers, resigned. Mr. Hammond is highly respected in the club, having been its secretary for two years prior to his going to Paris.

The Frank Adams Electric Company, St. Louis, Mo., have sent us their interesting and attractive folder on "The Control of Lighting in Theatres."

The catalogue of the Harry Weiss Manufacturing Company, Atchison, Kan., with blue prints and specifications of Westtell Compartments, should be in the files of every architect. There are a number of illustrations showing buildings in which they have been used.

If you haven't the following booklets, issued by the Armstrong Cork Company, you should send for them: "The Story of Linoleum," "Armstrong's Linoleum Floors," "The Art of Home Furnishing and Decoration," and "Detailed Directions for Laying and Caring for Linoleum." They contain information of value.

Armstrong's Sanitary Linoleum Cove and Base.—For hospitals and institutions of similar character where it is necessary to provide a sanitary trim that meets the floor and which affords no place for the collection of dirt, Armstrong's Sanitary Cove and Base is especially recommended. This cove and base is made of the same materials used in Armstrong's linoleum and comes in the three battleship colorings—brown, green, and gray. It is made six inches high only, and in 18-inch long sections, with convex and concave corner sections made separately.

Samples of Armstrong's Sanitary Cove and Base will be mailed to any architect free upon request.

Architects who desire to specify Armstrong's Sanitary Cove and Base for use in connection with linoleum floors will find the specifications helpful.

Tourist's Guide to Connecticut.—Most tourists in New England, especially those who have a particular interest in historic places and possibilities for collecting antiques, have, as a rule, neglected Connecticut for other New England States. To such persons a "Tourist's Guide to Connecticut," recently published by the Mattatuck Historical Society of Waterbury, Conn., will be of interest. The material contained in this carefully prepared eighty-page booklet is arranged in such a way as to be of immediate use to visitors to any town in Connecticut, and includes under each town heading whatever is of scenic, historic, or antiquarian interest there. The "Guide" can be secured by sending four cents for postage to the Mattatuck Historical Society, 119 West Main Street, Waterbury, Conn.

New Westinghouse Commercial Lighting Unit.—A new commercial lighting unit, known as the Sol-Lux, combining a number of distinctively new features that should appeal to jobbers, dealers, and architects, as well as to customers, has just been brought out by the Westinghouse Electric & Manufacturing Company. This is the first commercial lighting unit produced by the Westinghouse Company, and is the result of several years of development work and an exhaustive series of tests.

Graver Corporation, steel tanks and general steel plate construction, water-softening and purifying equipment, with general offices and works at East Chicago, Ind., have sent us their new booklet containing data prepared by their engineering department, entitled "Zero or One and One-Half—Which"?

Concrete in Home Sanitation.—There is no subject of greater importance to the home-owner, or, for that matter, to the nation, than that of home sanitation. His own and his family's health and welfare depend upon the most efficient disposal of wastes, the protection of water-supply, and the exclusion of rats and mice from the home. As part of its service to home-owners, the Portland Cement Association has just published a new booklet "Concrete in Home Sanitation," which contains under one cover the subject-matter of several separate booklets issued in the past together with newly prepared material.

We commend to every reader the June number of *Through the Ages*—the story of marble. It is handsomely printed and the illustrations are especially interesting.

In the advertisement of the National Terra-Cotta Society, the chapel of the Carmelite Convent, Santa Clara, Calif., was by mistake attributed to Albert M. Cauldwell, architect. The architects are Maginnis and Walsh of Boston, and we express the company's regrets at this error.

A Correction.—In the announcement of the competition of the Alabama Marble Company, for a travelling scholarship the scale of the elevations has been changed from $\frac{3}{16}$ inch equal 1 foot to $\frac{1}{8}$ inch equal 1 foot.

Frederick J. Griffin, architect, Member American Institute of Architects, Member New Jersey Society of Architects, Registered Architect for New Jersey, 1913, announces the removal of his office to the Chamber of Commerce Building, 24 Branford Place, Newark, N. J.

Henry K. McGoodwin, well-known architect, has been appointed head of the Department of Architecture and chairman of the Faculty of the College of Fine Arts, at Carnegie Institute of Technology, Pittsburgh, to assume his duties with the next college year. In his twofold capacity, Mr. McGoodwin will succeed Professor Harry Sternfeld, acting head of the Architectural Department, and E. Raymond Bossange, director of the College of Fine Arts, both of whom have resigned. Incidentally, Mr. McGoodwin's choice is a reappointment, as he was acting dean of the College of Fine Arts, and head of the Department of Architecture when he left the institution five years ago.

Willard M. Ellwood announces that by mutual agreement he has resigned his position as architect and structural engineer for the H. G. Christman Company of South Bend, Ind., and has opened an office at 220 West Jefferson Boulevard, in Rooms 204, 205, and 206 Russell Building, in that city, where he will engage in general architectural practice.

F. E. Johnson, architect, announces that on May 1, 1923, George R. Griswold became associated with him for the practice of architecture, under the firm name of Johnson & Griswold, architects and engineers, Suite 31–39 Wisconsin Block, Superior, Wis.

D. K. Swartwout, president, announces that The Swartwout Company, having purchased the Swartwout Products Division of The Ohio Body & Blower Company, will continue to manufacture and sell the Swartwout rotary ball-bearing ventilator. Former sales policies will remain unchanged. The new organization can now render the architect and engineer better service in connection with ventilation problems. All branch offices and sale agencies will be continued to give prompt, personal assistance.

Fenestra Factory in California.—Of particular interest to architects on the Pacific coast is the announcement by Mr. Victor F. Dewey, president of the Detroit Steel Products Company, of the establishment of a factory at Oakland, Cal., for the manufacture of Fenestra Steel Windo-Walls.

On a recent trip to the coast Mr. Dewey selected a plot of ground comprising a city block at Emeryville, a suburb of Oakland, and construction of the first unit, a model factory building of concrete and steel sash has been started under the direction of H. F. Wathen, Pacific coast manager of the Fenestra Construction Company, a subsidiary of the Detroit Steel Products Company, which specializes on steel-sash erection work. This unit will be in production by June 15, it is expected.

The Need of a Forest Policy

"THE need of government intervention of some kind to conserve the waning timber supply stands out as extremely important," says the third annual report of the United States Tariff Commission, which has just been issued. It continues: "This is a policy the urgency of which the lumber interests themselves are beginning openly to acknowledge. They appreciate the necessity for conservation not only in the interest of consumers, agriculture, inland navigation, and water-power, but also because the problem is one with which private enterprise is powerless to deal without governmental intervention or co-operation."

With reference to the lumber export trade, the tariff commission points out that the only country subjecting American producers to serious competition is Canada. "Nevertheless," it says, "the United States is exporting lumber as well as importing lumber from Canada, and both the United States and Canada export lumber of the same general character to all important markets throughout the world. These facts appear to indicate that costs of production cannot be markedly different in the two countries, and that, taken as a whole, producers in the United States are in a position to compete with those of Canada. However, the Canadian frontier is long and in some regions competition is severe."

Guth Lighting-Fixture Interests United

THE Edwin F. Guth Company, designers and manufacturers of lighting equipment, is the new name by which the unified interests of the St. Louis Brass Manufacturing Company and the Brascolite Company, of St. Louis, will hereafter be known.

The two companies amalgamated have always been interrelated, the Brascolite Company being a division of the St. Louis Brass Manufacturing Company.

The St. Louis Brass Manufacturing Company, the parent company under the old régime, was incorporated in 1902 by Edwin F. Guth and associates, for the manufacture of lighting fixtures of all types. The business had a remarkable development from the very beginning, and in 1907, having outgrown its original quarters, found it necessary to build and equip a new plant.

1913 marked the invention and introduction of the Brascolite—a new principle in scientific illumination. The Brascolite Company was organized to market this new fixture, and the Brascolite is now the largest selling lighting fixture in the world.

Again extensive additions to floor space and equipment had to be provided. In 1915 a five-floor addition was built, followed in 1919 by a still larger addition, which more than doubled the space occupied in 1907.

Following the introduction of the Brascolite, other improvements and innovations, such as Aglite, Aglite, Jr., Magic-Lite, Elite, Concealite, Industrolite—and now Maze-Lite, a new home fixture just going on the market—have been introduced, until to-day Guth service includes scientific lighting equipment of every type and style and for every purpose.

Unusual Home-Building Plan Launched by Western Electric

EMPLOYEES of the Western Electric Company at its big plant near Chicago have evolved their own scheme of solving the rent question. The Hawthorne Club, the plant employees' organization, which has over 25,000 of the factory personnel on its membership lists, has developed two plans. One offers a means of lowering the costs per person desiring to build; the other is a financing system on the building and loan idea.

The State of Illinois has just granted a charter to the Hawthorne Club Savings, Building and Loan Association for a period of ninety-nine years.

The new association is issuing three classes of stock to its members. Its Class A stock, which has a maturity value of $100 per share, is paid for at the rate of 25 cents a week per share. At the average profit of a building-loan organization the A securities will be paid for in 328 weeks, or a little more than six years. The subscribers who are anxious to build can obtain a loan representing the entire maturity value of the stock to which they have subscribed immediately after their application for the stock is accepted. It has been figured that they will pay only a trifle over 3 per cent a year on their debt instead of the legal 6 per cent.

Photo shows exterior of Federal Reserve Bank, Boston, Mass. Architect: R. C. Sturgis, Boston. 114,000 yards of *Gold-Seal* Battleship Linoleum laid in corridors and offices, by Bonded Floors Co.

"A surety bond with every floor"

Bonded Floors in Modern Banks

We recommend without reservation four types of resilient floors that are giving the utmost satisfaction in a large number of bank buildings throughout the country.

Each one is resilient, permanent, and easy-to-clean—on each one we issue a 5-year Surety Bond for the full amount of the contract.

Of these floorings *Gold-Seal* Battleship Linoleum, made in four attractive colors—gray, green, brown and terra cotta—is the most inexpensive. The most quiet and comfortable underfoot is our Cork Tile. These floors are used chiefly in working spaces, where it is desired to deaden the noise of employees' footsteps and make standing less tiresome.

To obtain richness and harmony with the decorations of an interior we suggest *Gold-Seal* Treadlite Tile, which is made in a variety of colored tile effects, or *Gold-Seal* Rubber Tile, which duplicates the luxurious appearance of the finest marbles.

By specifying any one of these floorings you obtain the services of a nation-wide organization which specializes in the proper installation of resilient floors.

Here are listed just a few banks in which we have recently installed quiet, comfortable floors:

Mechanics & Metals Bank, Broadway and 66th St., N.Y.
Architects: Delano & Aldrich

Chase National Bank, Prince St. and Broadway, N.Y.
Architects: Graham, Anderson, Probst & White

Rahway National Bank, Rahway, N. J.
Architect: T. M. James

Brookline Savings Bank, Brookline, Mass.
Architect: F. J. Untersee

Marine Trust Company, Atlantic City, N. J.
Architects: Dennison & Hirons

Hartford Connecticut Trust Co., Hartford, Conn.
Architect: Benjamin Morris

BONDED-FLOORS-COMPANY

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FLOORING-ENGINEERS-AND-CONTRACTORS

New York · Chicago · Boston · Philadelphia · San Francisco · Cleveland · Detroit · Newark · Jamaica · Los Angeles

MAIN ENTRANCE ON MALL, FREER GALLERY OF ART, WASHINGTON, D. C.

Charles A. Platt, Architect.